

25th

ANNIVERSARY of Whole Earth

Bruce Sterling, Paul Krassner,
Jaron Lanier, Kevin Kelly,
R. Crumb, Ron Jones,
Donella Meadows,
Peter Coyote,
Will Baker,
Brian
Eno

REVIEW

ACCESS TO TOOLS & IDEAS

Guest-Edited by Stewart Brand, founder of the Whole Earth Catalog



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UNTHINKABLE FUTURES
page 4

R. CRUMB '93

25th Anniversary Observation: Time is a Better Organizer of Ideas Than Editors

BY STEWART BRAND (WHOLE EARTH EDITOR, 1968-1984)

I HAVE A THEORY about theme issues of magazines. I think they're a bad idea.

Once a theme issue announces its grand exploration on the cover ("MEN — Will They Ever Get Equal Rights?"), immediately everyone uninterested in that subject will be chased away, perhaps forever. Those who *are* interested in the subject are almost certain to be bored by it by the end of the exhaustive treatment. And some articles of so-so quality are bound to be thrown in to fill out the illusion of completeness, which then degrades the whole enterprise. This is why anthologies sell so badly as books; readers are justifiably wary.

So why do so many magazines do it? Because of advertisers, marketers, and, alas, editors. Advertising departments love to have theme issues blocked out as much as a year in advance so they can sally forth and round up new theme-related advertisers who might just stay on as regulars. (A year in advance means the magazine has blown its main publishing advantage: contemporaneity.) A magazine's marketers like to imagine that a gaudy cover trumpeting an urgent theme will out-elbow the other covers jabbering at passersby from the magazine rack, and they're sure that "secondary press" will abound when one's newsworthy special issue is quoted in other media.

The motivations of us editors are rather sadder. We envy the writers that we bully. They do content; we merely do form. It's such grotty, unappreciated work assembling an issue — this article first, then that one, how about so-and-so as illustrator; big deal. So we grasp at the idea of Organizational Content — an important theme. That's real value-added! That's a lot of thoughtful work for editors to do. Maybe we should hire some more.

The result is to further diminish writers, who become mere pawns in editorial grand schemes. And the real loser, then, is the reader, because what the writers

have to tell and what excites *them* in the real world is the best value the magazine has to offer.

If *Whole Earth Review* has something special that has kept it in business for twenty-five years — an eon in the ephemeral magazine biz — it is the direct connection between writers and readers. We don't carry ads, so there's no advertising department (and thus less vulnerability to economic downturns like the current recession.) We've got just a couple underpaid marketers. And we can't afford a phalanx of editors. It's a writers' magazine.

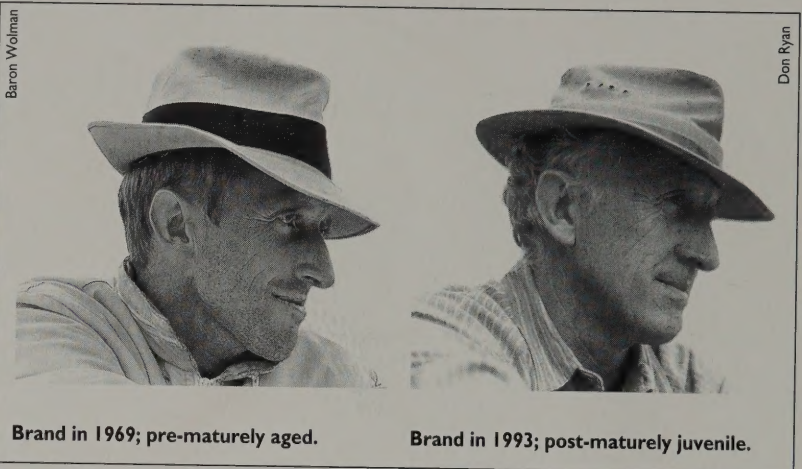
Any number of people, when they heard I was guest-editing this issue, inquired, "What's the theme going to be?" I fear they all got a version of the pissy sermon you just read. This issue is *not* about *Whole Earth* and its glorious history, nor about What Went Wrong and What Went Right With the Sixties (though I was tempted), nor about The Great Changes 25 Years Have Wrought, nor even about The Next 25 Years. There's a nod to the future in pieces like "Unthinkable Futures" and Kevin Kelly's "Cypherpunk" report. And a nod to the past in the stories of what happened to the tree-huggers in India ("Chipko Revisited") and what happened to one of *Whole Earth's* most

influential articles ("Based on a True Story").

But mostly this issue is just a collection of what I found most interesting and available in the winter of 1992-93. The organizers of the issue are the times and my peculiar curiosity responding to the times.

That's a pretty thin formula for a magazine, but it's really all we've offered all these years. The *Whole Earth Catalog* was originally a twice-a-year periodical when I started it in 1968, delivering strictly "access to tools" — recommendations of the best do-it-your-own-damn-self books, catalogs, magazines, and gear. Pretty quickly we added a scuzzy *Difficult But Possible Supplement to the Whole Earth Catalog*, which came out every two months and began to print articles as well as reviews. From time to time all this would be glopped together into a book, and our "501(c)3" nonprofit operation would be embarrassed by real revenues for a season or so. The erroneously (but sincerely) named *Last Whole Earth Catalog* even won a National Book Award in 1972. (Gratifyingly controversial: one of the judges complained "It's not a book!" and quit.)

I quit too, and shut down the business to see what happens when you stop a



Brand in 1969; pre-maturely aged.

Brand in 1993; post-maturely juvenile.

big success in mid-stride (it makes lots of money, having zero overhead). In 1974, having discovered nothing better to do, I restarted the whole thing as a magazine, *CoEvolution Quarterly*, which looked and felt much like what you're holding in your hand. The formula was: follow an editor's curiosity and don't get in the way of the writers. If anyone thought I was a crucial ingredient, they

were disabused of that notion by the success of guest-edited issues and by the editorial regimes of Kevin Kelly (1984 - 1990) and Howard Rheingold (1990 - present; Howard will be back next issue, having finished his book for Addison-Wesley, *Virtual Communities*). Continuity was provided by a cadre of part-time domain editors — J. Baldwin, Richard Nilsen, Robert Horvitz, et al. — and by a production staff and a busi-

ness staff of ever-deepening skill.

Ah well, anniversaries should be occasions for self-flagellation rather than self-congratulation (a fair amount of thrashing is going on behind the scenes), and *Whole Earth Review* tends to refer to itself a bit too often and lovingly in print as it is, so I'll stop and let the writers take over.

Wait. One last back-to-the-future announcement. I hear there's another *Whole Earth Catalog* in the works. Details elsewhere in this issue . . .

STEWART:

HERE'S MY COVER DESIGN — OKAY, IT'S KINDA **NEGATIVE**, BUT, Y'KNOW, YOU ASKED FOR IT — LOVE ME, LOVE MY LOWLY ATTITUDE... IT'S, LIKE, A KIND OF JAUN- DICED PARODY OF THE COVER OF THE WHOLE EARTH CATALOGUE... SO, IF YOU DECIDE TO USE IT, ALL THE LETTERING AND THE LOGO SHOULD BE IN WHITE AGAINST THE DARK BACKGROUND. I WOULDN'T BE AT ALL SURPRISED IF YOU DIDN'T WANT TO USE IT, THOUGH, WHAT WITH THE CONSISTENTLY BRAVE, OPTIMISTIC FACE THE MAGAZINE TRIES TO PUT ON LIFE ON THIS FUCKIN' PLANET — EVERY ISSUE FEATURES NEW SOLUTIONS TO THE BIGGEST PROBLEMS AND DANGERS CONFRONTING US... I, TOO, LOOK FORWARD EAGERLY TO EACH NEW ISSUE, TO SEE WHAT THE LATEST WAY OF COPING IS... IF EVERYBODY WAS LIKE ME WITH MY MISANTHROPY AND DESPAIR IT'D BE A GRIM WORLD... EVEN GRIMMER THAN IT ALREADY IS — BUT THEN AGAIN, IF EVERY ONE WAS LIKE ME THERE WOULDN'T BE MAMMOTH BULLDOZERS KNOCKING DOWN THE RAINFORESTS... "WHY DON'T THEY GO HOME AND READ A BOOK?" THAT'S WHAT I SAY... TH' THING IS, A LOT OF THE "WHOLE EARTH" READERS DON'T WANT TO SEE THIS WISE-ASS "NEGATIVITY"... THEY DISLIKE IT... THEY'LL WRITE ANGRY LETTERS... ESPECIALLY THE WOMEN... THESE BERKENSTOCK-WEARERS... THEY HATE ME... TIM LEARY HATES ME... I'M A BIG BRING-DOWN... HERE THEY'RE STRUGGLING SO HARD TO MAIN- TAIN A CONSCIENTIOUS, POSITIVE, "LIFE AFFIRMING" ATTITUDE, AND THEY GOTTA PUT UP WITH MY CRAP? "CANCEL MY SUBSCRIPTION, PLEASE!" SO, I CAN APPRECIATE WHY YOU MIGHT NOT WANT TO PUT THIS THING ON THE FRONT OF YOUR BIG 25TH ANNIVERSARY ISSUE... IT'S NOT VERY "UP-BEAT"... ALSO HERE IN ARE SOME RECENT SKETCHBOOK PAGES, SOME REFLECTING MY LIFE HERE IN MY NEWLY ADOPTED COUNTRY, SOME DONE IN MY TRAVELS BACK TO THE 'OLD COUNTRY' (THE U.S...)... THERE ARE A FEW DRAWINGS BY MY DAUGHTER SOPHIE INTERSPERSED WITH MINE... USE WHAT YOU WANT...

—R. CRUMB





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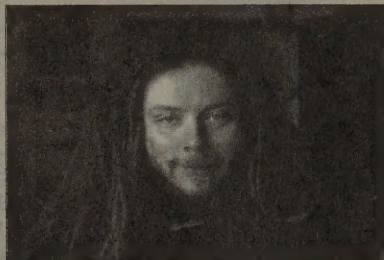
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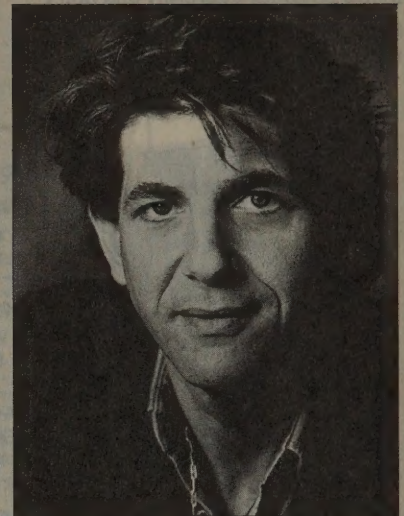
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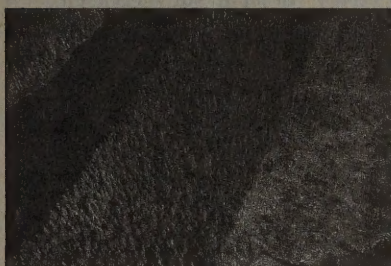
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COVERS

R. Crumb's mandate for the front-cover painting was to do "something on the coming twenty-five years." It's his third cover for us. *CoEvolution Quarterly* #14 (Summer 1977) was graced by a bevy of his classic mega-women exuberantly sowing voluntary simplicity while menfolk trucked on the back cover. *CQ* #24 (Winter 1979) featured an American working stiff complete with A-bomb headpiece and what turned out to be rather controversial swastika eyes. There's more Crumb on p. 66.

On the back cover is a front cover — our first — battered but still Whole, accompanied by some good news of a successor. —J. Baldwin



UNTHINKABLE FUTURES

KEVIN KELLY:

- A new plague seizes the world. As fatal as AIDS, but transmitted on a sneeze, and spread by airplane travelers, the virus touches billions within a year.
- Computer power plateaus. The expected doubling of power and halving of chip size slacks off. More computer power can be had, but it costs.
- Computer screens (both CRT and flat screens) are found to be dangerous to the health. Working at a computer is viewed as a toxic job.
- Alcohol is so severely restricted that people need "licenses" to drink it. Tobacco is, of course, prohibited from being sold. You

can grow your own, though, and some do. The underworld moves to North Carolina as cigars become contraband.

• American education works. Revived by vouchers, a longer school year, private schools and for-profit schools, the majority of Americans (though not the most disadvantaged) get the best education in the world.

• Japan is eclipsed by the Asian tigers. The success of Japan subverts itself: women rebel, the young drop out, the workers play, and the system declines.

• Catalog direct marketing dies. Inherently private electronic money and stricter privacy laws kill the hopes of bar-code


What follows is a conversation. Knowing its original context may add to its value. Kevin Kelly — editor of this publication from 1984 to 1990 — and Brian Eno — British musician, music producer, and artist — posted these conjectures in a private conference on The WELL run by the Global Business Network (GBN). GBN's

main activity is long-term strategic planning for organizations large enough to plan ten to twenty years into the future, and its main tool is scenario planning. Scenario planning encourages responsibility in organizations by helping them think far ahead, but the process of generating wide-ranging scenarios gains from irresponsible thought. You need "what if" ideas unpolluted by wishful thinking.

"Unthinkable" thoughts have the virtue of bringing to serious consideration wholly repressed ideas,

as evidenced by the laugh that often accompanies them. They frequently express real fears that people have, that are based on real events, but which they are forbidden from speaking for one political or psychological reason or another. They posit the kind of harsh turnabout in public affairs that often happens in reality. And they relieve a serious limitation of standard scenario planning, which is plausibility. This is the crucial difference between fiction and real life: fiction must be plausible; real life has no such constraint.

So inspired, Kevin Kelly created a topic (string of online comments) on "Unthinkable Futures" in GBN's WELL conference. Brian Eno took Kevin's bait and then turned into a monster of perverse creativity. Kevin fought back gamely. Later Brian expanded three of his notions into *Unthinkable Stories* (p. 9). Can you predict which ones? —SB



dreams and direct marketing in general.

- Nobody wants to be a doctor. It becomes an overwhelming bureaucratic job with low status. Women and minorities become working doctors; men do medical research.

- The human genome project is halted by activists. Placards at demonstrations say: "Our DNA, Our Selves."

- Third World nukes become commonplace. Everybody has one, because everyone has nuclear power plants.

- Mass advertising is restricted. Billboards are categorically banned; advertising in subways, buses, removed. Towns take up "Advertising-Free Zones."

- People begin leaving the US. Many arrivals to the US keep resident status but choose not to adopt citizenship. The world sees more people without allegiance.

- It costs half a day's pay to drive your car into the downtown area of a big city, and a day's wages to park.

- No more employees. Everybody is hired as a consultant, each negotiates a deal with various goodies (benefits, insurance, perks). Even factory workers are treated as "consultants."

- Women retreat en masse from the commercial workforce. They stay with their families, work with nonprofits, or work part-time.

- All voice phones are universal flat rate. Data is still metered.

- American universities go franchise. Ivy League schools launch branches in Tokyo, Berlin, London.

- Revitalized cities squeeze out the urban poor to squatters' suburbs. Inner cities flourish. The poor take over the nearest suburbs, between edge cities and downtowns. With little transportation in the suburbs, the poor are really downtrodden.

- In a series of science papers, biologists prove that humans are weakening their gene stock with such artifices as eyeglasses and medical care, since "biologically inferior" stock now breeds. This sets off religious and scientific eugenics cults and social

weirdness around "healthy" genes.

- Pills make a comeback. Psychedelics, smart pills, power drugs and a host of newly invented non-addictive head pills seep into the young generation, who have no memory of the last drug phase.

- Twenty-five years from now, the American public becomes even more conservative at the grass-roots level than it is now, and the Reagan years are viewed as "moderate."

by Kevin Kelly and Brian Eno

BRIAN ENO:

- Everybody becomes so completely cynical about the election process that voter turnout drops to 2 percent (families and relatives of prospective politicians) until finally the "democratic process" is abandoned in favour of a lottery system. Everything immediately improves.

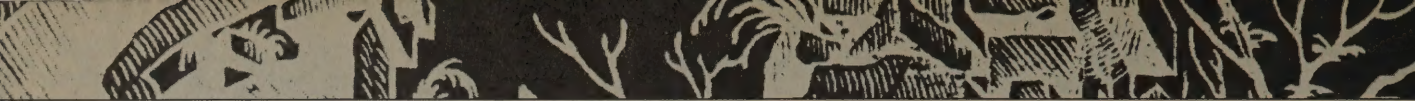
- It turns out that nearly all the conspiracy theories you ever heard were actually true — that the world really is being run by 150

malevolent men with nasty prejudices.

- Smoking is proven to be good exercise for the lungs.

- Genetic research shows that it is possible to create gifted scientists, great artists, sublime linguists and supreme athletes. Everyone starves to death through lack of farmers, cooks and waiters.

- It becomes clear that there are significant racial differences between people — that



the stereotypes were right after all.

- Ordinary people routinely employ publicists.
- Public relations becomes the biggest profession in wealthy countries.
- Sexual roles reverse: men wear makeup and are aggressively pursued and harassed by women in ill-fitting clothes.
- Video phones inspire a new sexual revolution whereby everybody sits at home doing rude things electronically with everyone else. Productivity slumps; video screens get bigger and bigger.
- Suicide becomes not only commonplace but socially acceptable and even encouraged. People choose when to die: living too long is considered selfish and old-fashioned.
- A new profession — cosmetic psychiatry — is

born. People visit “plastic psychiatrists” to get interesting neuroses and obsessions added into their makeup.


- Meanwhile, as the cult of youth fades away, plastic surgeons find a profitable new market in making people look interestingly wrinkled, wisely aged, and experientially weatherbeaten. Also, as Oriental aesthetics sweep the West, the traditional values of physiological symmetry and freedom of blemish are seen as naive and uninteresting. Perfect youngsters from Colorado, after years of fretful mirror-gazing, finally save enough money to get their noses put on wrong, or to have a few teeth blackened.
- Tanned skin is once again seen as the mark of peasantry. Sunblock-wearing becomes routine.

• Mass outbreaks of allergies unexpectedly solve all our transportation problems by confining almost everyone to their sealed residences. Telecommunications stocks soar.

- 2025 AD: A social archaeologist discovers a cowshed built from nineteen old Julian Schnabel paintings.
- Abandoned highrise projects become the residence of choice for the new urban chic, changing hands for ever-increasing sums, until finally only lawyers and stockbrokers (skillfully posing as members of dispossessed minority groups) are able to afford them.
- 2010 AD: California elects the first transsexual governor. All public toilets are redesigned at great expense.
- New drugs to pacify children (modern laudanum) are smilingly

sold by big pharmaceutical companies (wish they'd hurry up!).

- A new kind of holiday becomes popular: you are dropped by helicopter in an unknown place, with two weeks' supply of food and water. You are assured that you will not see anyone else in this time. There is a panic button just in case.
- Seed companies start selling packets of unpredictable mutants produced by random genetic engineering programmes: “JUST PLANT 'EM AND SEE WHAT COMES UP!” Suburbia is covered with exotic new blooms and giant cucumbers.
- A new concept of “global Darwinism” takes root: people argue for the right of the human species to rid itself of weak specimens. Aid to developing coun-



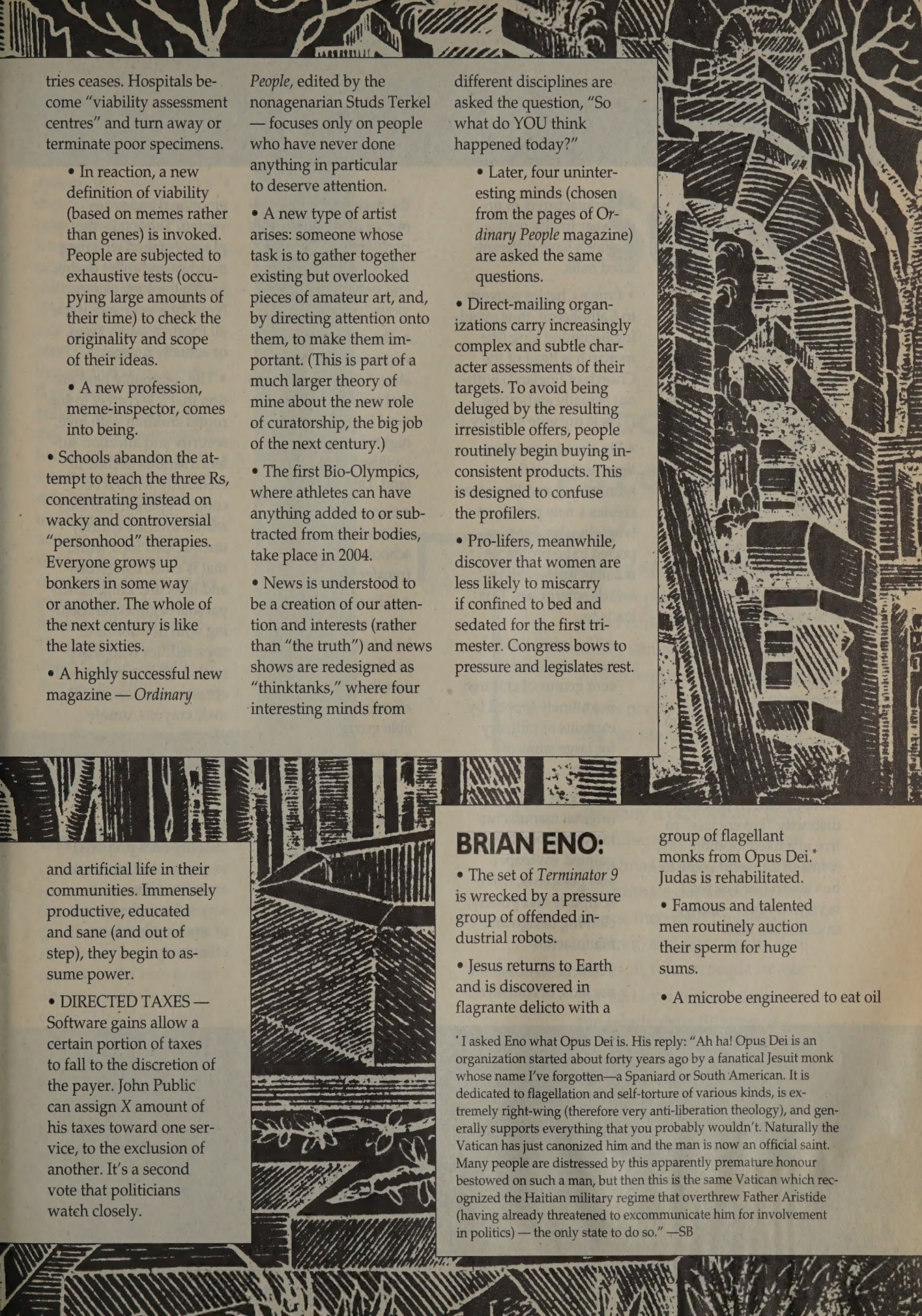
KEVIN KELLY:

- AFRICA AWAKES — Centrally located, Africa becomes the breadbasket of Europe, the Mideast, and the wider markets of North America. It becomes a postindustrial continent, a combination of high- and low-tech agriculture.
- GLOBAL COOLING — After a steady increase in mean temperature, the Earth starts cooling off. Dire warnings are issued; no one pays any attention.

- INFO-TERRORISTS — Hitting where it hurts most, a radical group with access to nukes threatens to destroy the Library of Congress if their demands are not met. No action is taken until the American public realizes that all the great TV shows from the past are stored there.
- GREEK OLYMPICS — To save money, the Olympics are permanently sited in Greece.
- TEPID WAR — America and Europe devise a new

style of dynamic socialism, which they try to export against the wishes of a thoroughly free-market Russia.

- BARBECUES OUTLAWED — Because of high carcinogenic content, nothing barbecued or burnt may be sold, nor barbecue paraphernalia. Private barbecues (cannot be seen from street, etc.) become hip underground.
- TV AMISH — Groups, most of them religious, ban all TV, virtual reality,



tries ceases. Hospitals become "viability assessment centres" and turn away or terminate poor specimens.

- In reaction, a new definition of viability (based on memes rather than genes) is invoked. People are subjected to exhaustive tests (occupying large amounts of their time) to check the originality and scope of their ideas.
- A new profession, meme-inspector, comes into being.
- Schools abandon the attempt to teach the three Rs, concentrating instead on wacky and controversial "personhood" therapies. Everyone grows up bonkers in some way or another. The whole of the next century is like the late sixties.
- A highly successful new magazine — *Ordinary*

People, edited by the nonagenarian Studs Terkel — focuses only on people who have never done anything in particular to deserve attention.

- A new type of artist arises: someone whose task is to gather together existing but overlooked pieces of amateur art, and, by directing attention onto them, to make them important. (This is part of a much larger theory of mine about the new role of curatorship, the big job of the next century.)
- The first Bio-Olympics, where athletes can have anything added to or subtracted from their bodies, take place in 2004.
- News is understood to be a creation of our attention and interests (rather than "the truth") and news shows are redesigned as "thinktanks," where four interesting minds from

different disciplines are asked the question, "So what do YOU think happened today?"

- Later, four uninteresting minds (chosen from the pages of *Ordinary People* magazine) are asked the same questions.
- Direct-mailing organizations carry increasingly complex and subtle character assessments of their targets. To avoid being deluged by the resulting irresistible offers, people routinely begin buying inconsistent products. This is designed to confuse the profilers.
- Pro-lifers, meanwhile, discover that women are less likely to miscarry if confined to bed and sedated for the first trimester. Congress bows to pressure and legislates rest.

and artificial life in their communities. Immensely productive, educated and sane (and out of step), they begin to assume power.

- **DIRECTED TAXES** — Software gains allow a certain portion of taxes to fall to the discretion of the payer. John Public can assign X amount of his taxes toward one service, to the exclusion of another. It's a second vote that politicians watch closely.

BRIAN ENO:

- The set of *Terminator 9* is wrecked by a pressure group of offended industrial robots.
- Jesus returns to Earth and is discovered in flagrante delicto with a

group of flagellant monks from Opus Dei.* Judas is rehabilitated.

- Famous and talented men routinely auction their sperm for huge sums.
- A microbe engineered to eat oil

* I asked Eno what Opus Dei is. His reply: "Ah ha! Opus Dei is an organization started about forty years ago by a fanatical Jesuit monk whose name I've forgotten—a Spaniard or South American. It is dedicated to flagellation and self-torture of various kinds, is extremely right-wing (therefore very anti-liberation theology), and generally supports everything that you probably wouldn't. Naturally the Vatican has just canonized him and the man is now an official saint. Many people are distressed by this apparently premature honour bestowed on such a man, but then this is the same Vatican which recognized the Haitian military regime that overthrew Father Aristide (having already threatened to excommunicate him for involvement in politics) — the only state to do so." —SB

slicks evolves a taste for rubber.

Transport grinds to a halt on burst tyres. People stay home and have sex more, but condoms crumble routinely. World population doubles in six years.

- As scenario projections become more accurate and convincing, people become increasingly aware of the unwelcome results of their actions. All social action becomes paralysed, or is evaluated in purely negative language: "Is this course of action less harmful than that?"

- Traveling as a process enjoys a revival. People abandon the idea of "getting from A to B" and begin to develop (or re-discover) a culture of traveling: semi-nomadism. Lots of people acquire super new faxed-and-modemed versions of the mobile home. It becomes distinctly "lower-class" to live in a fixed location. Fast forms of transport come to be viewed like fast food is viewed now — tacky, undesirable, fake.

- Manufacturers of underwear finally realize that men have different-sized balls.

- Prince Charles converts to Catholicism, thus avoiding becoming king (the monarch is head of the Church of England) without actually abdicating. (This is my wife's theory.)

- Big changes in education: A combination of monetarism and liberalism creates a new paradigm wherein schools are expected to be profitable manufacturing and research enterprises. This leads to:

- The infant think-tank, where the innocent genius of children is routinely tapped by captains of industry for large sums of money . . .

- Various highly original manufacturing industries: hand-painted wallpaper and postcards, naive sculpture and pottery, clothing design and manufacture . . .

- Teachers chosen (by the kids, of course) on

the basis of their performance record and likely profitability. They are subjected to gruelling and penetrating interviews by kids . . .

- The old concept of education "in the abstract" (i.e., unrelated to real tasks) is only practiced in the most benighted outposts of the civilized world (England, USA etc.) . . .

- Successful children are traded between schools for huge transfer fees . . .

- Schools completely abandon divisions based on age. People of all ages turn up and sort themselves into effective and profitable groups . . .

- People with lots of money give their children small companies as birthday and Christmas gifts.

- Television producers, impressed by the phenomenal success of the Clarence Thomas hearings, routinely stage semi-surrogate "hearings" where

emotional issues are vented. These take the place of staged wrestling matches and roller derby for the thinking classes. Nobody is ever sure if it's all fixed, or partly fixed, or actually for real.

- The commonly held notion that it is correct to surround children with love, security and affection suffers a serious decline in credibility when it becomes apparent that kids reared thus are entirely unequipped for a world that is cruel, dangerous and insecure. Enlightened parents begin experimenting with new forms of toys: teddies with sharp teeth, building bricks with abrasive surfaces, mildly toxic crayons, unsafe play areas.

- Disabled people finally come into their own as remote operators of telerobots. They are the only ones prepared to commit the immense amount of time necessary to learn the finesse of working inside another body.

KEVIN KELLY:

Over the next fifteen years, climatologists and system dynamicists conclusively show that the Earth's climate shift is not due to human activity: it has its origins in the ongoing shifts normal to the Earth. (This is somewhat Lovelock's current position.) Most surprisingly, scientists see that slow, accumulative carbon dioxide buildup is the only thing that will halt the upcoming hot- or ice-age. And it has a narrow window. So they recommend burning as much fossil fuel as possible to avert global climate shock. After twenty years of constant sermons on the evils of carbon dioxide, this is a political disaster. The environmentalists' cheer: "Let's sink with dignity and purity."

BRIAN ENO:

I just had a kidney stone removed last week. I had this idea that, given the devaluation of diamonds, rich people in the future might actually turn to kidney stones (produced by exotic Third World ladies fed on stone-producing diets) as their new precious gems. I kept mine — though it's not very big. Today I'm getting scanned to see if there are any more. I feel like a potential oyster. ☘

Unthinkable Stories

BY BRIAN ENO

COSMETIC PSYCHIATRY

THE SURGERY WAS DELIGHTFUL:

airy and plant-filled, and with a tinted window through which amber sunlight burst. Shirley was so happy she'd finally come.

It was her friend Sylvia who'd told her about it. She'd known Sylvia since college, and, out of inertia more than anything else, they'd occasionally meet for coffee and send each other Christmas cards, exchanging not-too-intimate details about their affairs, then their husbands, their children, and now, again, their affairs. It was an acquaintance marked by a reliable dullness, the steady drip-filtering of normal-life titbits.

Until, that is, Sylvia took the plunge into cosmetic psychiatry and emerged sparkingly neurotic, full of psychic texture, a fountain of bubbling idiosyncracies. Now she was the life and soul of the kaffee-klatsch — so much to talk about! It was hard, actually, to ever catch her at home these

Art on previous pages: Lorenz Stoer, fantastic architecture from *Geometria et perspectiva*, 1555.

days, let alone arrange to meet with her, so full was her diary. Her newly scatty giggle, her wild outbursts of anger, her amusing absentmindedness, made any gathering come to life. And then, a few months later, when her estranged husband Jeffrey (who'd always been such a *drip*) went under the same metaphorical knife and emerged as a conceptual artist with an engaging speech defect and mild multiple schizophrenia, their lives took a whole new turn. Jeffrey (now also bisexual) moved back in and they fought and fucked, bellowed and threatened and howled with manic laughter practically round the clock. Everyone wanted to visit them, to be able to say they'd attended the wacky party where Sylvia downed Jeff with a single blow of a Chablis bottle, or the one where Jeff was discovered having anal sex with Sylvia's brother, the Curate of Montreal, in the woodshed, or, most memorably, the time they dropped hallucinogens together and somehow completely exchanged personalities, Sylvia furiously arguing among herself about decommodification and floating signifiers, while Jeff incessantly sprayed permset on his shining bald pate and optimistically combed the air. It was a complete *riot*, everyone agreed.

Inspiring though all this was, Shirley felt she was after something a little less dramatic. She'd been through the catalogue of nervous disorders and was attracted both to manic depression and obsessive behaviour. It was the doctor who persuaded her that obsessive behaviour, though slightly more expensive to do, was actually very appealing and easily updated. This mattered a lot to Shirley — after all, you didn't want to get stuck with the same neurosis forever — and then she read that Stephanie Wilson, the actress, had one done and as a result always had to open the door with the same hand or else she got *real mad*. Everyone remarked on it. On the talk shows they

always arranged things so that Stephanie *had* to open a door with the wrong hand. It made for fabulous TV.

Shirley's mind was made up.

SHE OPENED HER EYES, emerging slowly from the anaesthetic cloud. The room around her stopped wobbling and fell into place. Some vaguely familiar soft music was playing, something ambient. Outside in the sunny gardens, young birds twittered and a lone dog barked haphazardly. The warm eyes of the doctor and nurse gazed down at her. She tried a smile.

"How are you feeling?" asked the nurse, stroking the back of her hand. And the doctor, not waiting for her reply, said: "Everything went just fine. You were a perfect patient."

The nurse reached behind Shirley's head and helped her into a sitting position. The room was delightful — peach and gold — except for *UGH!* (how *on Earth* hadn't she noticed them before?) those *absolutely dreadful* curtains. Some vile sub-Laura Ashley print — *completely* disastrous.

"They'll have to come down immediately," she stated flatly and incontro-

It was the doctor who persuaded her that obsessive behaviour, though slightly more expensive to do, was actually very appealing and easily updated.

vertibly, her angry, trembling finger directed accusingly at the curtains. "I *hate* florals at the best of times, and these are *particularly* disgusting." Shirley was shaking with rage. She thought she'd never felt so upset.

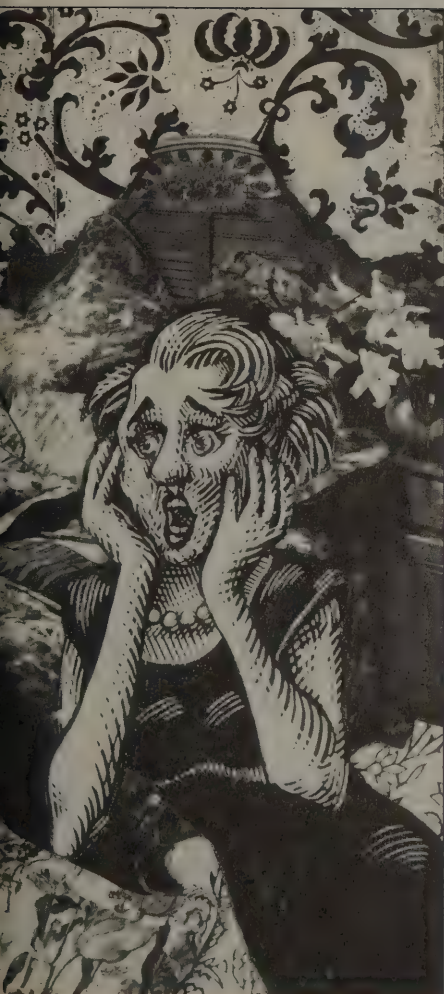
"But of course, of course," said the nurse, breathless with apologies. "We'll see to it right away. They'll be gone when you get back from lunch." She reached for the phone and said something to the maintenance department. As she spoke, she flashed a quick smile to the doctor, who returned it with a conspiratorial wink. The operation had worked, of course, but just to confirm it they would arrange for Sylvia's lunch to be served on a complete rose-pattern service. ☺

Kathleen O'Neill



PERSONAL PROFILE

The real problem was that profile marketing was extremely successful. It seemed that everyone made a big fuss about the intrusion, and then went straight out and bought the goods.



WITHIN MOMENTS OF waking up, Daniel Xavier Shelton remembered: today was his thirty-eighth birthday. And what a lovely day it seemed to be: the October air felt crisp and clean, and the light had that early-winter coldness that he liked so much. He decided not to work, but to take a day off from the network and go for a long walk instead. This was one of those days he really enjoyed being single.

As the coffee percolated, he turned on the radio. The sentimental strains of "Oh, Danny Boy" burst into the room. "Oh God," he thought as he spun the tuning-dial, "I should have known." The radio blipped and squeaked through the closely packed frequencies. He settled on a news channel, catching the end of an item about some potentially menacing new development in the North African trade wars. He listened as he warmed his miso soup.

"... And meanwhile, local observers have claimed that heavily subsidized Libyan parallel-processing computers are now being dumped onto sub-Saharan markets. Chad has threatened to retaliate by withdrawing support from the Pan-African Neural Network Agreements which she co-sponsored last year with Mali.

"And now back to London, where today is the birthday of [a slight voice change here] DANIEL X. SHELTON. Happy birthday, DANNY! This message comes to you from HARVEY WINGER, at your local branch of THE GAP. He'll be looking out for you today, DANNY, and has a small gift for you at the shop. So why not come and say hello to HARVEY at THE GAP?"

"Bloody hell," thought Danny, "They can put a man on Venus but they still can't convincingly match the voice-bites." The news returned, and Danny crossed the room to open the

blinds. As he did so, he heard a loud fanfare from the street below. Three smiling young blondes, rather scantily dressed as pageboys, raised long trumpets festooned with heraldic red-and-yellow flags and blasted fanfare samples at his window. An awning over their heads proclaimed:

*The Swedish Tourist Board
congratulates you Danny on
your happy day.*

*Why not spend the next one with
us? Call Freeview 0800-SWEDEHOL
& we'll show you just how
welcoming we can be...*

The girls were still fluttering their eyelashes and flexing their hips as Daniel turned away. He was, he told himself, unmoved by their thinly veiled invitations. That stuff was really old hat now. But he was at the same time a little troubled by the realization that, in the eyes of the market profilers, he now belonged to the age-and-status group that would be susceptible to such temptations. And he had to admit that the girl on the left *was* a bit more interesting than usual. He found himself looking out at her again. For the first time that day, he felt a little middle-aged.

In the background, the computer pinged regularly and persistently as it registered receipt of his email. He relied on his code sorter to pull out the stuff he actually needed to see, but since his model was now over eight weeks old, it would let a lot of the smarter stuff through. The profilers seemed to learn your codes and interests faster than your friends could these days.

From the bathroom window, as he shaved, he caught sight of the puffs of skywriting in the cloudless sky:

DANNY! CALL MUM!, it shouted across the top of the city.

MUM, of course, was the acronym for Medical Underwriters' Management, a large health-insurance company. Well, thought Danny, you really have to give them marks for trying. And then he remembered suddenly that he *had* actually been

thinking of extending his medical coverage. Perhaps he would call MUM. He made a note into his handheld.

In the early days of profile marketing (when it was still called junk mail), people made tremendous efforts to remain invisible to the market-research companies. The whole thing was felt to be a gross invasion of privacy. There had been numerous attempts to undermine the profiling project: people moved into very poor neighbourhoods, for example, to confuse the computers that generated the profiles, or occasionally bought goods that were completely inconsistent with their lifestyles. Whole universities, in revolutionary temper, invented systems where nobody ever bought anything they might use themselves, but instead engaged in complex forms of barter with one another. It never really got off the ground because of the numerous profile-informers on campus. A lot of people made their way through college secretly profiling their friends.

But the real problem was that profile marketing was extremely successful. It seemed that everyone made a big fuss about the intrusion, and then went straight out and bought the goods.

And so gradually, like all those little invasions, people grew used to it, and even came to expect it. It didn't bode well for your social prospects, for example, if you weren't routinely surrounded by a buzz of sales activity. There were even agencies which could generate false marketing activity around you, so that you could appear more sought-after than you actually were. Imagine the situation: you're sitting at a candlelit dinner in a theme-restaurant, gazing into the eyes of a new prospective mate, when the waiter discreetly interrupts with a dusty and venerable bottle of Burgundy to which is attached a note:

Best wishes to you both for a wonderful

evening. Do call in again, Danny, at the Gallery. There's a rather fabulous late Tang vase I think you'd like to see.
—Jeremy

DANNY GOT DRESSED and left the apartment. The air was bracing and he waved away the offer of a limousine ride from F&R HiFi, but accepted the hand-held personal weather forecaster from the Hampstead Garden theme park (*where it's always sunny, Danny*) and walked swiftly away from the neighborhood.

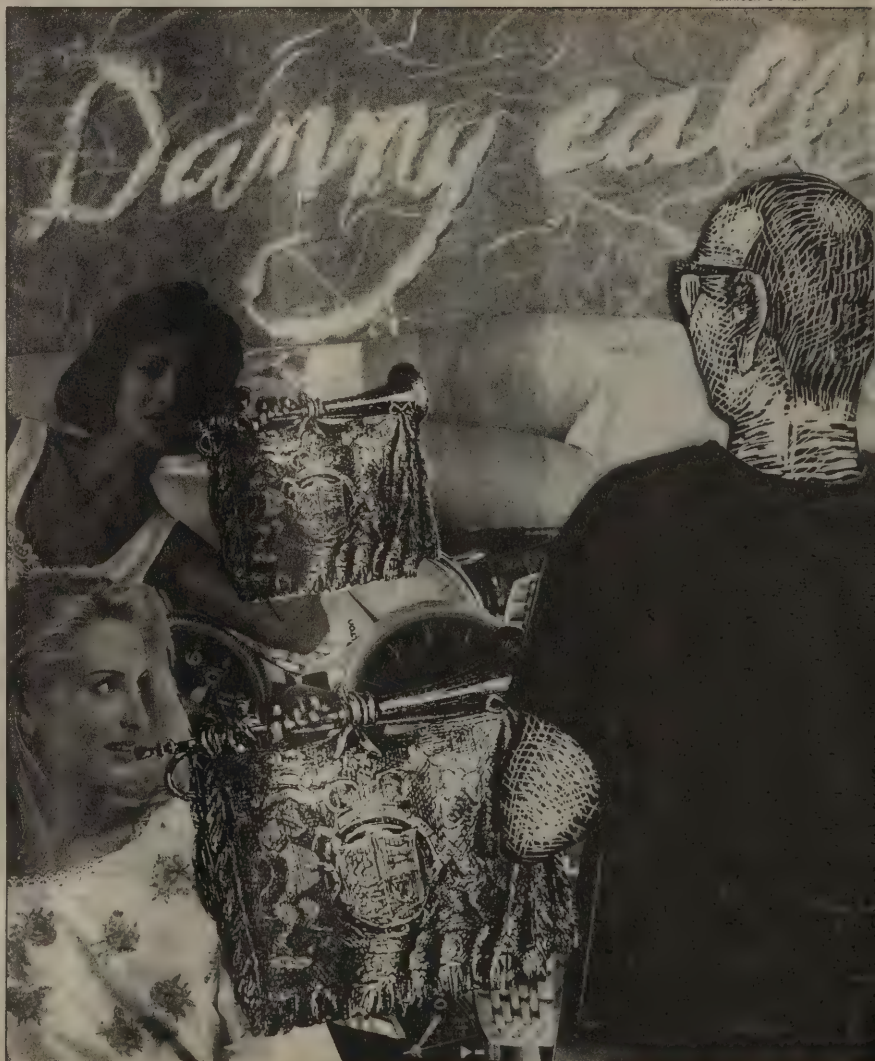
The park was almost empty. Some ordinary-looking people walked their dogs and the joggers continued their lonely, panting circuits. A slight

frost still sparkled on the grass. It felt great to be alive in this big oasis of silence. Danny looked at his new weather forecaster. It showed a picture of clear blue skies and a slowly falling temperature. Then suddenly the tiny screen changed to a slowscan movie of the Nude Themepool at the Hampstead Garden park.

How amazing! There on the screen, smiling and radiant, and slowly lowering her gorgeous nude body into the glittering water, was the pagegirl he'd caught himself admiring that morning in the Swedehol ad. Her breathy, girlish voice emerged thinly from the tiny speaker:

"It's lovely once you're in, Danny." ☘

Kathleen O'Neill



AUCTION

The gavel fell to close the sale, and suddenly Beryl's tummy erupted in butterflies. This was really it. Now there was tangible tension in the air.



BERYL WAS TERRIBLY excited. She'd been on the edge of her seat for the whole auction but hadn't bid once. She was waiting for the third-from-last lot: Number 180. By the way the hall began filling up as the morning wore on, she had the feeling that many of the other women were doing the same.

The auctioneer's shrill voice cut through the hubbub. Her assistant emerged from a side door carrying a large photograph of a handsome black man — Tadd Robinson, the charismatic champion surfer. In his heyday back in the nineties, the auctioneer reminded her clients, Robinson was virtually unbeatable.

"'Brave' is too mild a word for this big, powerful man," she said, and then added with the merest trace of a smile, "as perhaps is 'big'." The crowd tittered at the mild sexual innuendo and then listened politely as the auctioneer opened the bidding.

"Lot 179: we have seven specimens of Tadd Robinson, all in prime condition and all collected when he was twenty-nine years old — in his fourth year as World Surfing Federation Champion. We are directed to offer the seven specimens as one lot. May I now open the bidding at \$20,000?"

There was no response from the floor. The auctioneer quickly scanned the crowd.

"Who'll start me at fifteen?" she said brightly. "Come on now, ladies, you know this is an excellent price."

From the left of the hall, a smart woman with a double-breasted suit and fashionable gold-mirror contact lenses raised her pen slightly.

"Ten," she said, with no trace of emotion. Beryl turned to look at her

— obviously an institutional buyer, probably bidding on behalf of one of the big speculative gene banks. They often stockpiled the larger lots, keeping them stored at minus-70 until the whims of the market turned — or were changed — to their favour.

Another woman, clearly professional, entered the bidding; the lot was quickly settled at \$18,000. The gavel fell to close the sale, and suddenly Beryl's tummy erupted in butterflies. *This was really it.* Now there was tangible tension in the air. The institutional buyers began filing out disdainfully, but as quickly as they left other women and couples squeezed in to take their seats. The place was completely crowded. Beryl glanced around at the others and saw them doing the same: weighing up each other's relative wealth and prospects.

The auctioneer cleared her throat and lightly tapped the table. There was an instant hush.

"The next lot, as I'm sure you all know, is very special indeed. It is really a one-of-a-kind."

As she spoke, the assistant raised a photograph, obviously greatly enlarged from a rather grainy original, of a genial, elderly, still-handsome man. He was almost completely bald, and his clear, kind eyes squinted as though at a strong sun. His face was turned upwards, away from the camera, looking into a bright future. On his great forehead there was a strange, dark birthmark.

"Mikhail Gorbachev," said the auctioneer, "was first president of the liberated USSR. He lost that post, of course, but what he is really remembered for is his subsequent presidency of the United States. This truly remarkable man helped America rethink its place in the world — and if there is one person of whom it is possible to say, 'He saved the world', then it must surely be him. The nature of his disappearance is still a complete mystery, but that mystery is certainly no greater than

the provenance of the sperm specimen which we are auctioning today. We simply do not know when, where, or by whom it was collected. All we know is that it is genetically identical to Mikhail Gorbachev, and so we must assume that it is in fact his. Apart from the genemap, however, there is no paper on this item."

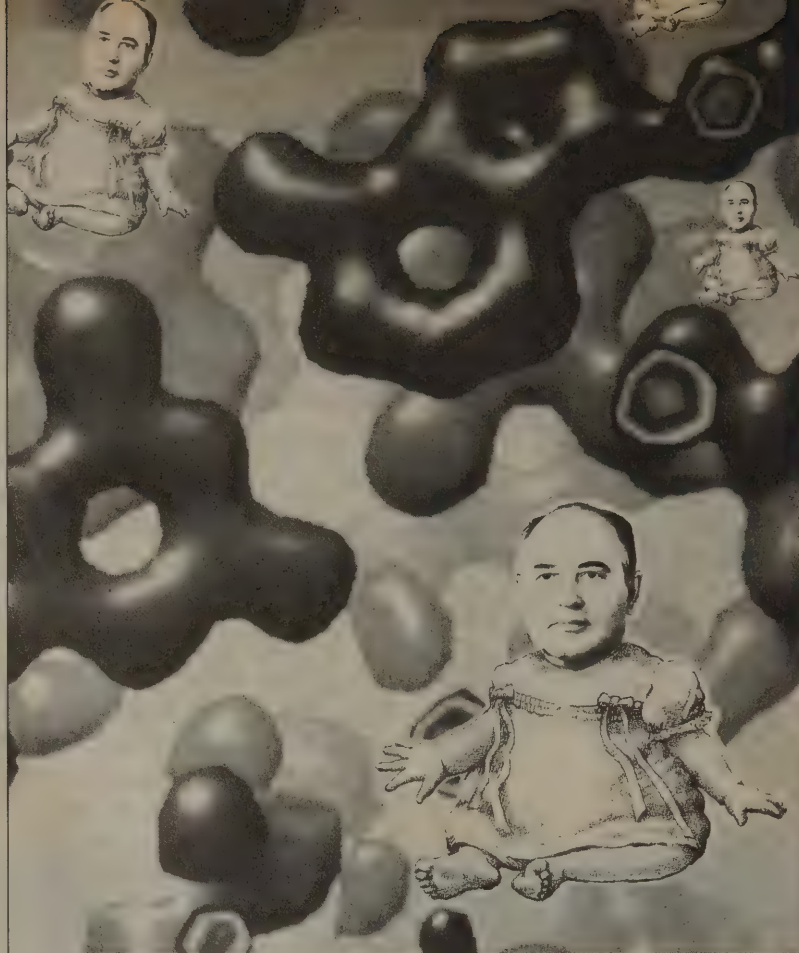
The stirring speech generated a flurry of muttering in the hall. Beryl thought back over the past year, since the time the Gorbachev specimen had come to light. She remembered those first excited hopes, the pie-in-the-sky conversations with her husband Robert, and his immediate attraction to the idea. Like most men of his generation, Robert was infertile, and his search for the right father for his children had taken him through all the usual choices — fighter aces, football players, Nobel prizewinners, balding synthesizer players. But Robert was nothing if not ambitious, and when the Gorbachev specimen turned up — well, that was it. He was going for it.

"It's an investment, is how I see it," he said, bent over a sheet of figures on the kitchen table. Beryl remembered leaning on his shoulder and watching his pencil racing up and down the columns, him calculating the odds of it taking, then the odds of it being a boy, and then the likely value of *its* future sperm.

"Yup," he said, "There's a risk factor, but the payoff could be huge. I think we could raise it from the bank if I have a word with them. And anyway, even if it's a girl, it's still a Gorbachev!" Robert was completely convinced and wouldn't hear a word of Beryl's dutifully expressed cautions, her halfhearted can-we-really-afford-it's; he (thank God, she thought) ploughed right ahead.

And then her parents had offered to chip in too.

"Look, if it goes over the 250 thou, you can count on us for another hundred." Dad, like most people of his generation, remembered Gorbachev



Kathleen O'Neill

very fondly, and obviously relished the idea of being grandfather to his child. And Mum was unusually excited, occasionally calling at odd times in the evening to say things like, "But I really think you *must* teach the child Russian as a second language."

BERYL AND ROBERT decided not to show their new child to the media until the day after his birth. By then the whole maternity ward was swarming with teams of camera-people connected to each other by long cables, clustered round attractive reporters talking chirpily into their microphones.

Robert cuddled the little boy under the lights and looked proud, pointing, for the benefit of the cameras, to the dark birthmark on the child's neck. The whole of the town council (which had ended up contributing \$100,000 to the price of the gene specimen on the grounds that it

would be a great profile-raiser for the city) was waiting to get in the door while the mayor talked emotively to another camera team about the symbolism of this new beginning.

Huge clumps of exotic flowers filled every spare corner of the room, and Beryl's mother fussed over them, looking for windowsill space. A delivery girl pushed her way through the throng to hand Beryl yet another bunch. Beryl looked at the accompanying card:

Warmest congratulations to you and your new arrival from all of us at Atlanta Gene Supplies. Oh Happy Day!

We do hope you'll get in touch with us when you're ready to discuss his future. Remember, you can count on a "Yes" at AGS.

She put it with all the others on the bedside table. Her eyes briefly met with Robert's. They flashed triumphant smiles. They were so happy. ☺

Generations

Though this book enchanted me from the moment I picked it up, I resisted reviewing it for months. The idea seemed too pat, too simplistic: that inevitable eighty-year cycles turn the wheel of culture, and that each new generation plays out its role in one-fourth of that cycle.

For instance, according to this book, the "G.I." generation (age 68-91), a generation of civic materialists, built the architecture of our time, including the Cold War, living just long enough to see it collapse beneath them. The "Silent" generation (age 50-67), reacting to their predecessors through "passages" like those Gail Sheehy described, produced the iconoclastic beatnik spirit of the early 1960s. They were followed by the "Boomer" generation (age 32-49), self-absorbed and moralistic, and then by "Generation 13" (elsewhere known as Generation X, age 11-31) — which everyone, including themselves, considers substandard. Finally, just now being born, a new generation of civic materialists is slouching into view (below age 11), dubbed the "Millenarians" herein, ready perhaps — who knows? — to rebuild us into World War II and the Cold War all over again.

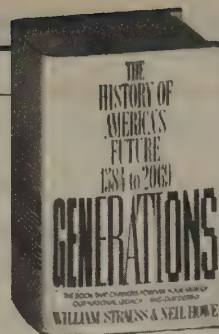
Most intriguing is the book's spinning of this cycle back through time, with echoes of the "Boomers" (for instance) from the Transcendentalists of Brook Farm and the muckrakers of the 1890s. Sometimes, as you work your way through the parallels, the book feels like an astrology text — purveyor of an arbitrary framework that merely appears to resonate. Nonetheless, that's a small price to pay for a snapshot of our time from an historical perspective. Some pattern clearly does exist in the flow of generations, spinning through decades instead of months, visible only in fragments, producing great hidden waves of cultural surge and retreat, like the tides. —Art Kleiner

It's a highly valuable book. The generational-dynamic proposal works backward — for re-understanding American history — and forward — for prediction. And it gives everyone a story to belong to. The authors sure got my generation right. —"Silent" SB

• No one, for example, can foretell the specific emergency that will confront America during what we call the "Crisis of 2020" — nor, of course, the exact year in which this crisis will find its epicenter. What we do claim our cycle can predict is that, during the late 2010s and early 2020s, American generations will pass deep into a "Crisis

Era" constellation and mood — and that, as a consequence, the nation's public life will undergo a swift and possibly revolutionary transformation.

• Think of the oldest family ancestor (or mentor) you knew as a child, and the youngest heir (or protégé) you expect you will know at age 80. That is the span of generational history you occupy. Chances are, your span will roughly match the current length of the history of the American nation, the 214 years from 1776 to 1990. In an age when a "long-term" weather forecast stretches a few months and a "long-term" budget forecast a few years, this two-century epoch demonstrates what "long-term" does in fact mean. And why we should care about it.



Generations

(The History of America's Future, 1584-2069)

William Strauss and Neil Howe, 1992; 544 pp.

\$12 (\$13.50 postpaid) from William Morrow and Co./Wilmore Warehouse, 39 Plymouth Street, Fairfield, NJ 07004; 800/237-0657

The Art of the Long View

To not be surprised by the future is an art that has more to do with storytelling than with trend extrapolation. This useful craft, called scenario-spinning, does not try to predict the future. Instead, a few good plot lines (each internally plausible) are played out, five, ten, or twenty-five years into the future. The goal is to work laterally and consider the unexpected — the very surprises that undo most extrapolations. Scenario-spinning is a simple technology: enjoyable, low-tech, obvious in retrospect but indispensable if adopted (much like the idea of a budget). Any organization committed to long-term planning would benefit from employing scenarios. And the rest of us would benefit if we had more organizations taking the long view.

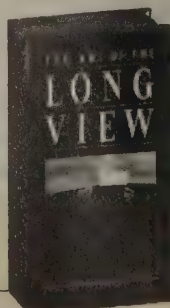
Peter Schwartz, a futurist formerly of Shell Oil (where the scenario technique was developed), gives an extremely readable introduction to the method and virtues of thinking ahead. Give a copy of this short book to the people you know who are steering an organization, institution, or company in these uncertain times. — Kevin Kelly

The Art of the Long View

(Planning for the Future in an Uncertain World)

Peter Schwartz. Doubleday & Co., 1991; 258 pp.

\$22 (\$24.50 postpaid) from Bantam, Doubleday, Dell/Fulfillment Dept., 2451 S. Wolf Road, Des Plaines, IL 60018; 800/223-6834



• The Unbroken Line

One cautionary note in developing plot lines. When things get worse, people often expect them to get much worse, until they produce devastation — war, economic collapse, apocalypse. Thus, watch out for the unbroken line — conditions that change, but do not engender any response. If there is dramatic continued growth, look for the undertow of resistance which will slow down the growth. The threat of war breeds resistance to war. Environmental threat breeds ecological activism. Japan's prosperity has provoked forces in competing countries (Korea, Taiwan, France) and in Japan itself (its severe labor shortage). It is the prophecy itself that leads to change and the prophecy's negation.

• Hindsight is useful for sharpening your foresight. That's why I recommend that you practice such a "retroductive" scenario yourself. Imagine that you had been trying to write the scenario for your company, or yourself, or your country, ten years ago. What would have been the right scenario, what would have been the plot, what were the driving forces, what were the critical elements, what could you have seen then that you didn't?

• The point of scenario-planning is to help us suspend our disbelief in all the futures: to allow us to think that any one of them might take place. Then we can prepare for what we don't think is going to happen.

• You can tell you have good scenarios when they are both plausible and surprising; when they have the power to break old stereotypes; and when the makers assume ownership of them and put them to work.

I believe the intellectual life of the whole of Western society is increasingly being split into two polar groups. . . . Literary intellectuals at one pole — at the other scientists, and as the most representative, the physical scientists. Between the two a gulf of mutual incomprehension.

A good many times I have been present at gatherings of people who, by the standards of the traditional culture, are thought highly educated and who have with considerable gusto been expressing their incredulity at the illiteracy of scientists. Once or twice I have been provoked and have asked the company how many of them could describe the Second Law of Thermodynamics. The response was cold; it was also negative.

—C. P. Snow (1905-1980), author of *The Two Cultures and the Scientific Revolution* (Quote found by Robert Fuller)

BY JOHN BROCKMAN

IN THE PAST FEW YEARS, the playing field of Western intellectual life has shifted. The traditional intellectual has become increasingly marginalized. A fifties education in Freud, Marx, and modernism is not a sufficient qualification for a thinking person in the nineties. Indeed intellectuals in the West are, in a sense, reactionary, and quite often proudly (and perversely) ignorant of many of the truly significant intellectual accomplishments of our time.

In 1959, C. P. Snow wrote about *The Two Cultures*. On one hand there were the literary intellectuals; on the other hand, the scientists. He noted with incredulity that during the 1930s the literary intellectuals "while no one was looking took to referring to themselves as 'intellectuals' as though there were no others." This new definition of the intellectual by the "men of letters" excluded scientists such as astronomer Edwin Hubble, mathematician John von Neumann, cyberneticist Norbert Wiener, and physicists Albert Einstein, Niels Bohr, and Werner Heisenberg.

How did the literary intellectuals get away with it? First, people in the sciences did not make an effective case for the implications of their work. Second, while many eminent scientists also wrote books for a general audience, their works were ignored by the self-proclaimed intellectuals, and the value and importance of the ideas presented remained invisible as an intellectual activity because science was not a subject for the reigning journals and magazines. Tradi-

Unlike many a literary agent, John Brockman reads the manuscripts of his clients, a detail appreciated both by authors and publishers. One byproduct is that he tends to work most with writers who titillate him; these tend to be scientists, since Brockman's main interest is in how civilization manages its joint hallucination called "reality," and scientists more than any others are the reality-shifters. He has seen the phenomenon he reports here up close, and he has a New Yorker's withering scorn for the pretensions of the literary establishment.

*John's a friend of mine since our avant-garde art days in New York in 1964 — I was performing "America Needs Indians"; he was writing *By the Way*. He has been Whole Earth's literary agent since 1979, peaking in 1983 with a \$1.3 million advance for the Whole Earth Software Catalog (we spent it all making two editions of the book).*

This piece was originally slated for publication on the New York Times op-ed page, got bumped into inventory (limbo) by a hot news day, was partially printed/reported in the Los Angeles Times, enjoyed a certain xerox-machine samizdat notoriety, and finally got printed in whole in Britain's New Statesman. And now here. —SB

tional intellectual culture, which dismisses science, is often non-empirical, it uses its own jargon, and washes its own laundry. It is chiefly characterized by comment on comments — a spiraling pyramid of comments eventually reaching the point where the real world gets lost.

In a second edition of *The Two Cultures*, written in 1963, Snow added a new essay, "The Two Cultures: A Second Look," in which he optimistically suggested that a new culture — a "third culture" — would emerge and close the communications gap between the literary intellectuals and the scientists. In Snow's third culture, the literary intellectuals would be on speaking terms with the scientists. Although I borrow Snow's phrase "the third culture," it is not the third culture he predicted. Literary intellectuals are not communicating with scientists. Scientists are communicating directly to the general public. The third culture consists only of those scientists and others whose anchor is in the empirical world, who, through their work and expository writing, are taking the place of the traditional intellectual in rendering visible the deeper meanings of our lives, redefining who and what we are in terms of our own species, the planet, the biosphere, and the cosmos.

Who are the third-culture intellectuals? A partial list includes zoologists Richard Dawkins and Stephen Jay Gould, physicists Roger Penrose, Freeman Dyson, and Steven Hawking, astronomer Martin Rees, biologist John Maynard Smith, psychologist Nicholas Humphrey, archaeologist Colin Renfrew, computer scientists Marvin Minsky and Danny Hillis, anthropologist Richard Leakey, and mathematicians Benoit Mandelbrot and Ian Stewart. The wide appeal of the third-culture thinkers is not due solely to their

writing ability. What traditionally has been called "science," today has become "public culture." Stewart Brand recently wrote that "Science is the only news. When you scan through a newspaper or magazine, all the human-interest stuff is the same old he-said-she-said, the politics and economics the same sorry cyclic dramas, the fashions a pathetic illusion of newness, and even the technology is predictable if you know the science. Human nature doesn't change much; science does, and the change accrues, altering the world irreversibly."

In this respect, the following are some of the scientific developments

The point is not that we are living in a cultural wasteland. Quite the contrary. Our third-culture intellectuals are our greatest resource, and ideas are becoming our most important export commodity.

to receive prominent play in the front pages of major newspapers in the past year or so: molecular biology, artificial intelligence, chaos, massive parallelism, neural nets, the inflationary universe, fractals, complex adaptive systems, superstrings, biodiversity, nanotechnology, the human genome, expert systems, punctuated equilibrium, cellular automata, artificial life, fuzzy logic, space biospheres, the Gaia hypothesis, virtual reality, cyberspace, and teraflop machines. These are just a few of the intellectual pursuits characterizing the third culture. The strength of the third culture is precisely that it can tolerate disagree-

ments about which ideas are to be taken seriously. There is no canon or accredited list of acceptable ideas. Unlike previous intellectual pursuits, the achievements of the third culture are not the marginal exploits of a quarrelsome mandarin class: they will affect the lives of everybody on the planet.

Traditional intellectual media played a vertical game: journalists wrote up and professors wrote down. This is an activity referred to as popularization. Today third-culture thinkers avoid the middleman and write their own books, much to the consternation of those people with a vested interest in preserving the status quo. Some scientists have seen that the best

way to present their deepest and most serious thoughts to their most sophisticated colleagues is to express these thoughts in a manner that is accessible to the general intelligent reading public. For instance, some of Stephen Jay Gould's most "popular" writings are also, deservedly, the most influential among his professional colleagues.

There have been many articles expressing surprise at the recent great publishing successes of serious science books. But such successes are surprises only to old-style intellectuals. Their party line is that these books are anomalies — that they are bought, but not read. I disagree. Newly published science books

continue to appear on bestseller lists with regularity. Readers recognize that in science there is still a sense of wonder, and that scientists are providing maps to the real world. The emergence of this third-culture activity is evidence that many people have great intellectual hunger for serious ideas and are willing to take the time, and spend the money, to educate themselves regarding important new ideas.

Do we want to read the chatterings of the newly fashionable clique of anti-science pseudo-intellectuals, or do we want to read a computer scientist on building a massively parallel computer, a paleontologist writing about the interplay of chance and predictability in the history of life, or a cognitive scientist theorizing about consciousness as a virtual machine evolving in the brain?

Should we listen to the emerging voices of the third culture or to the dominant clique of tired and tiresome literary critics and their enclave of sycophants in the media and publishing worlds?

The role of the intellectual concerns communication. Intellectuals are people who know things and understand ideas and also shape the thoughts of their generation. An intellectual is a synthesizer, a publicist, a communicator. It is intellectuals with changing ideas and images — those scientists doing things and writing their own books — who drive our times. In *The Last Intellectuals*, Russell Jacoby bemoaned the passing of a generation of public thinkers and their replacement by bloodless academicians. He was right, but also wrong. The third-culture thinkers are the new public intellectuals.

The point is not that we are living in a cultural wasteland. Quite the contrary. Our third-culture intellectuals are our greatest resource, and ideas are becoming our most important export commodity.

America and Britain are the intellectual seedbed for Europe and Asia. This trend started with the arrival of Einstein and other pre-war European emigres, and was further fueled by the post-Sputnik boom effect on universities that has led to our superb array of institutions of higher education. In 1993, the emergence of the third culture introduces new modes of intellectual discourse and reaffirms the preeminence of the English-speaking world in the realm of serious and important ideas. Throughout history, intellectual life has been marked by the fact that only a small number of people have done the serious thinking for everybody else. What we are witnessing is a passing of the intellectual torch from one group of thinkers, the traditional literary intellectuals, to a new group, the intellectuals of the emerging third culture. ☺

Up the Infinite Corridor

Lyrical celebrating the arcane joys of MIT, Fred Hapgood manages to convey better than I've ever seen how the brightest people get swept into a life of engineering and science. You can see the genesis of the phenomenon reported in John Brockman's article about the "third culture" of scientist/writers taking over the intellectual forefront. If I didn't already love MIT, its people and their ideas, this book would make me do so. —SB

■ Perhaps the most advanced level of adaptation accepts the humor of being chronically, if marginally, off balance, and actually speeds up, embracing the experience of this psychedelic tumbling, these episodes of disorientation. Ordinarily this state of mind expresses itself in technical pursuits, but there are more accessible contexts, such as the popular dances sponsored by TechSquares, the MIT square-dancing association. These dances draw on an enormous vocabulary of calls, up to a few thousand, all of which a dancer (at that level) is expected to know. Some calls involve imaginary or "virtual" dancers,

Philip Morrison's Long Look at the Literature

*One peculiar subclass of technical literature never dates. Rooted in steadfast detail, this evergreen nonfiction can be read any year. Darwin's **Origin of Species** is a famous example. Philip Morrison, America's most articulate and most choosy nonfiction book reviewer, has collected a treasure chest full of little-known gems of this variety. A delightful trait of this genre is that each old tome will quickly immerse you in the details of some lovely strange new-to-you world, such as contemporary smugglers, or the whistle languages of the globe, or snack-food technology, or the packaging of eggs in Japan.*

Long Look at the Literature is a compendium of the most memorable science books Morrison has reviewed over the years in *Scientific American*. I'd guess that maybe one in a hundred books is worth rereading. Yet here are 100 reprinted book reviews of 100 incredibly rewarding science books that are as fresh today as they were, in some cases, twenty years ago. Often, reading Morrison's review is as good as reading the book. Most times, though, his unique synopses compel you to hurry to the li-

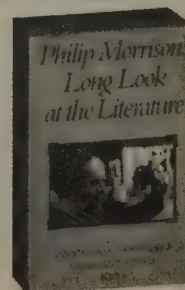
brary to hunt down the original literature itself. Either way, book or book review, every item here is an everlasting lapel-grabber. "Hey, listen to this!" —Kevin Kelly

■ The largest single smuggling trade today is the flow of gold bars, all of them the smooth little bonbon size, to the merchants and landowners of the western

Philip Morrison's Long Look at the Literature

Philip Morrison, 1990; 351 pp.

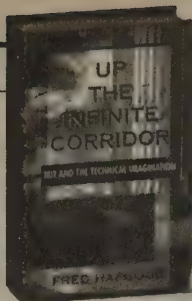
OUT OF PRINT. W. H. Freeman and Co., 4419 W. 1980 S., Salt Lake City, UT 84104; 800/488-5233



so-called "phantom spots," that give the choreographer 12 or 16 centers of motion instead of 8. . . .

Planning the sequences is a demanding art, almost always requiring a computer, and new sequences are required constantly; the experience loses its edge, or so dancers say, unless the series of calls is completely unpredictable. The challenge to the dancers is to keep the square going, to keep the group spinning and folding and unfolding as the caller jumps back and forth inside this huge volume of possibilities. If one dancer out of the eight takes more than perhaps a half-second to identify, remember, and execute the call, the square will collapse. The ideal is for the caller and eight dancers to bring each square to the edge of collapse and keep it balanced there, hanging over the face of the wave.

At one point in one dance a Kristofferson song, in a version played by the Mustang Boys, was on the turntable, and the caller, a thin, bearded engineer named Don Beck, issued a call that required the dancers to remember some number of calls in the past and repeat the sequence. Don had been calling for almost an hour, and the excitement and the music and laughter from the



Up the Infinite Corridor
(MIT and the Technical Imagination)

Fred Hapgood, 1993; 203 pp.
\$22.95 (\$24.95 postpaid) from Addison-Wesley Publishing Co./Corporate & Professional Division, 1 Jacob Way, Reading, MA 01867; 800/447-2226

floor had him soaring. Holding the mike up as if he was draining a bottle of beer, he strutted over the floor while the dancers twisted in front of him like moving vortices, spinning themselves out and reeling themselves back in, bouncing in and out of the center of the square, linking into nested rhombs and counterrotating triangles that passed in and out of each other, clenching and unclenching and coiling and uncoiling over the floor, like eight self-juggling balls throwing each other higher and higher.

states of India from the little port of Dubai. That excellent harbor is the capital of a sheikdom of the Trucial States, on the coast where the Arabian peninsula sends out a tooth to narrow the Persian Gulf. Dubai is a quiet, hot, coastal river town, but a dozen dealers there own busy teleprinters rattling with the London gold prices.

—*The Smugglers: An Investigation into the World of the Contemporary Smuggler*, by Timothy Green

[Paper's] humblest and most intimate use is also old; literary sources are primly silent, but in the sixth century a scholar, Yan Zhitui, wrote for his household: "I dare not use for toilet purposes" paper bearing the names of sages. An Arab traveler of the ninth century, accustomed to meticulous ablutions, was offended by what he regarded as the careless Chinese habit. Toilet paper was made cheaply in very large quantities from rice straw; in 1393 the imperial court alone bought 750,000 newspaper-size sheets, reserving a special quality for the imperial family.

—*Science and Civilisation in China*, by Joseph Needham: *Volume 5, Chemistry and Chemistry Technology, Part 1: Paper and Printing*, by Tsien Tsuen-Hsuei



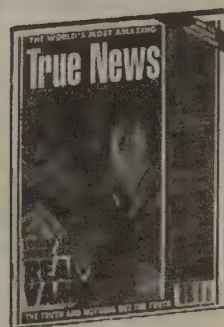
● *The Bottled Bandit*

Amateur historian and collector Walter Johnson of Santa Rosa, CA, proudly displays a three-gallon jug containing what he says is the preserved head of legendary Mexican bandit Joaquin Murieta. According to California lore, Murieta was a peaceful miner who became a dangerous desperado during the Gold Rush after his claim was stolen and his family attacked. California rangers supposedly killed the outlaw in 1853, although some authorities contend Murieta never actually existed. Johnson, who bought the head from "a man I trust," is convinced that the legend is true and that he has the pickled proof in hand. (AP)

True News

True fans of supermarket tabloids know that tabloid editors unabashedly make up most of the stories. These superbly crafted and headlined fantasies mirror the unconscious soul of a nation in the same way that popular urban legends do. Still, it's a shame the editors make them up, when the truth is at least as bizarre. Hail, then, **True News**, a brand-new supermarket tabloid with an interesting gimmick: they print only true bizarreness. By "true," they mean anything that has appeared on the news wires, in conventional newspapers, or on TV talk shows. We might call that transmission truthfulness, but it's worth something. And there are no horoscopes, cheesecake, or diet plans. What you get are lots of astounding, offbeat, hey-listen-to-this clippings, with photos — humankind in extremis. I'm a real sucker for reports of fringe characters, believe-it-or-not obsessions, items like the world records submitted to the **Guinness Book** but rejected for bad taste, and more stories of plain goofy people than one can ingest in one sitting. **True News** runs a

column called "Really Stupid Crooks" that makes my day.
—Kevin Kelly



True News
\$1.49 at discriminating supermarkets all over this great land of ours.

The Leopard • The Sand Pebbles

One life, one great book. It has happened twice. In 1957 Sicilian Prince Giuseppe Tomasi di Lampedusa, the last of his line, responded to a lifetime of loving books by taking up writing and telling a harsh, beautiful tale of self-destructive aristocrats in a self-destroying land. He died before knowing that **The Leopard** had a publisher, or that it would come to be regarded as Italy's finest novel and the best historical novel of this century.

In 1957 Richard McKenna, after a thirty-year career as an enlisted man in the U.S. Navy working through ranks in engine rooms, often in gunboats in or near China, responded to his lifetime of loving books by taking up writing in the manner of Hemingway — and outdoing Hemingway. **The Sand Pebbles** has a depth of knowledge of real life in a real place that Hemingway never achieved after the Michigan short stories. Navy people I know vouch for McKenna's account, and though the book is at times fiercely critical of the Navy, its current publisher is the Naval Institute Press.

Both books are masterpieces of contemporary literature, and page-turners of the quality of, say, Larry McMurtry's **Lonesome Dove**. Both convey unique worlds in convulsive transition — Garibaldi's Sicily and the Treaty Ports period of China — and troubled, admirable protagonists — Don Fabrizio and Jake Holman. Both books are life-enrichers.

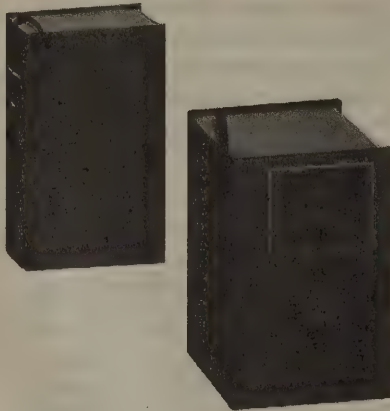
Both are now printed with the honor due them as classics, clothbound with a ribbon to keep your place. —SB

- Tancredi wanted to show Angelica the whole palace with its inextricable complex of guest rooms, state rooms, kitchens, chapels, theatres, picture galleries, odorous saddling rooms, stables, stuffy conservatories, passages, stairs, terraces and porticos, and particularly of a series of abandoned and uninhabited apartments which had not been used for many years and formed a mysterious and intricate labyrinth of their own. Tancredi did not realise, or he realised perfectly well, that he was drawing the girl into the hidden centre of the sensual cyclone; and Angelica at that time wanted whatever Tancredi did. Their wanderings through the seemingly limitless building were interminable; they would set off as if for some unknown land, and unknown indeed it was because in many of those apartments and corners not even Don Fabrizio had ever set foot — a cause

The Leopard

Giuseppe Tomasi di Lampedusa; translated by Archibald Colquhoun. Everyman's Library/Alfred A. Knopf, Inc., 1958, 1991; 300 pp.

\$15 (\$19 postpaid) from A Common Reader, 141 Tompkins Avenue, Pleasantville, NY 10570; 800/832-7323



The Sand Pebbles

Richard McKenna. Naval Institute Press, 1962, 1987; 597 pp.

\$29.95 (\$33.45 postpaid) from U.S. Naval Institute Operations Center/Customer Service, 2062 Generals Highway, Annapolis, MD 21401; 800/233-8764

of great satisfaction to him, for he used to say that a house of which one knew every room wasn't worth living in.

- He was making up a general balance sheet of his whole life, trying to sort out of the immense ash-heap of liabilities the golden flecks of happy moments. These were: two weeks before his marriage, six weeks after; half an hour when Paolo was born, when he felt proud at having prolonged by a twig the Salina tree (the pride had been misplaced, he knew that now, but there had been some genuine self-respect in it); a few talks with Giovanni before the latter vanished (a few monologues, if the truth were told, during which he had thought to find in the boy a kindred mind); and many hours in the observatory, absorbed in abstract calculations and the pursuit of the unreachable. Could those latter hours be really put down to the credit side of life? Were they not some sort of anticipatory gift of the beatitudes after death? It didn't matter, they had existed. —*The Leopard*

- There was always a clique of old hands in an engine room, and they always wanted a new man to learn from them as much as they wanted him to know and wait his time for admission to the clique. It always disturbed them to see Jake Holman learning by himself. They were afraid he would learn

too much and have power over them, and they were right. It was rough on them. They couldn't try to learn more themselves, because they had spent too many years pretending they already knew it all. They couldn't openly stop Holman from learning, because learning the plant was supposed to be good. So they always tried by the weight of their silent disapproval to force Jake Holman to stay as fumbling and ignorant as they were, and nothing in the world could spur Jake Holman on more than that silent disapproval. The machinery was always on Jake Holman's side, because machinery was never taken in by pretense and ignorance.

- Po-han had it, all right. He had the pure notion of energy, and his world would never be the same again.

The steam came aft through the main steam line like wild white horses. The throttle and the slide valves were gates and the horses ran invisibly down the connecting rods and out along the whitely spinning shaft. Only their pale ghosts went to the condenser. When there were too many horses in the boilers they kicked open the safety valves and charged off into the sky in a great, white, trumpeting host of horses. If the horses could not escape that way, they would kick the boiler apart and sink the ship.

"He beats hell, don't he?" Burgoyne marveled.

The most wonderful thing of all was that the horses could not die. They ran aft and kicked themselves free off the screw, and they became the motion of the ship and the turbulence of the wake, but they did not die.

"Nevah make finish!" Po-han said. "White hoss nevah die!"

"Never die," Holman confirmed.

- He saw Po-han in the curling flames and heard him in the whispering steam and the trickle of water into the hot well. It all came from the sun and it went where everything went. Along the way it shaped itself so you could know it, in a laboring engine or a warm and breathing man; you joined and mixed and knew. But you could not stop or hold it. It never ran backward. It went where everything went because it was everything.

Wild white horses. Wild white horses. . . .

Po-han would never be there again, smudged and oily and grinning, his eyes dancing with a new idea. Po-han was alone on the dark river sands, hanging from broken shoulders. His fires were out, his wild white horses charged off and lost in the big, dark sky. —*The Sand Pebbles*

A Common Reader

As I grow older (54 and counting) I find my interest in contemporary books is no less, but my appetite for classic books grows every year. For such tastes this is the very best of mail-order bookshops. The selection is for high quality, not narrow category, and the intelligence of selection is mirrored in the brief book descriptions. Since I buy from A Common Reader a good third of the many (too many) books I buy, my trust has grown to the point that I would feel comfortable stuck in an elevator with any of the thousand or so books offered.

Besides selecting the best of recent books, the catalog has full listings for the whole of the revived Modern Library editions, the lovely and inexpensive Everyman's Library (my current favorite), the Virago Modern Classics (all by women), and the glory of ancient Greece and Rome in the exhaustive original-plus-translation Loeb Classical Library. The service is excellent.

**By Elizabeth von Arnim:
The Enchanted April**

A discreet advertisement in *The Times*, addressed to "those who Appreciate Wisteria and Sunshine", is the prelude to a revelatory month for four women. Lured to the haven of San Salvatore, a medieval castle high above a bay on the Italian Riviera, each member of the quartet finds the respite she craves, while together the strangers discover a sense of harmony each has longed for but none has previously known.

#2372 250pp Paperback \$10.95

Gravity's Rainbow

by Thomas Pynchon

This book was a revelation when I first read it, and I've read nothing like it since. A dense, ribald, scabrous, scary, lunatic plunge into wartime London, *Gravity's Rainbow* is as indescribable as ascent and as satisfying as invective. Dive into it; you won't surface for days. Not for the squeamish.

#5982 760pp Paperback \$14.00

Venice: The Four Seasons

by Lisa St Aubin de Terán

In 1986, the British novelist Lisa St Aubin de Terán moved to Venice with her family. This volume—handsomely illustrated with the color photographs of Mick Lindberg—lets us in on the secret of what living in a city of such extraordinary imaginative dimensions is like. In these pages, the charms of the fabled place go hand-in-hand with the chores that make up the good part of any family's days. A thoughtful, stylish chronicle, with many beautiful photos.

#9576 104pp Hardcover \$30.00

Bonus: the catalog offers the best deal I've seen anywhere for the new **Compact Edition of the Oxford English Dictionary** — \$225 instead of \$325. —SB

A Common Reader

Catalog free. 141 Tompkins Avenue, Pleasantville, NY 10570; 800/832-7323

Inventing the Middle Ages

by Norman F. Cantor

The truth about history is that people read it, but never live it: it is a great imaginative edifice constructed to house the past. The bricks may be facts, the mortar research, yet the design and orientation of the structure is determined by concepts, ideas, and intellectual energies in many ways extraneous to the events the structure is meant to comprehend. In this intriguing study of the lives, works, and ideas of the great medievalists of the 20th century, Norman Cantor shows how these men and women—Frederic William Maitland, Marc Bloch, Erwin Panofsky, Ernst Robert Curtius, C. S. Lewis, J. R. R. Tolkien, Étienne Gilson, R. W. Southern, Johan Huizinga, and Eileen Power among them—"invented" the epoch we now identify as the Middle Ages. Cantor's ambitious, engaging survey is filled with episodes of scholarly adventure, and wonderfully steeped in the romance of books.

#7860 477pp Hardcover \$28.00

Levenger

A catalog of "tools for serious readers," offering lamps, chairs, bookshelves, and filing cabinets. I'm disabled and can't use my arms, so what attracted me to this catalog were the large oak bookholders. The one I ordered is a dandy, a handsome piece of work that holds the big books that have always been difficult for me to prop up, such as *The Riverside Shakespeare* and Shelby Foote's history of the Civil War. These bookholders can also be of use to able-bodied readers, because they make reading as easy as watching TV. This bookholder is the only item in the catalog I've tried and can vouch for, but the other things look good, such as the newspaper holder and the oak filing cabinets with metal runners. —Mark O'Brien

I'll vouch for the other stuff, Mark. I've bought lamps, furniture, and (like you) bookholders from these people, always with satisfaction. —SB

• What makes the Sunnex the world's best light for reading in bed is that it gives the reader — and only the reader — superb illumination, leaving the other person in darkness. It was first designed for Swedish electronic technicians who required a narrow beam of excellent white light — the

**Everyman's Library
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by George Eliot

This novel may be the wisest book I've ever read. At the center of Eliot's enormous portrait of Middlemarch, its society and inhabitants, is the story of Dorothea Brooke, a "home epic" of a brave woman learning how to live and what to live for. If there's a better novel in English, I'd be surprised.

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same requirement of nocturnal bibliophiles.

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Headboard Sunnex in Black #LB110 \$189
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Levenger

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“Follow Your Weird”

BY BRUCE STERLING

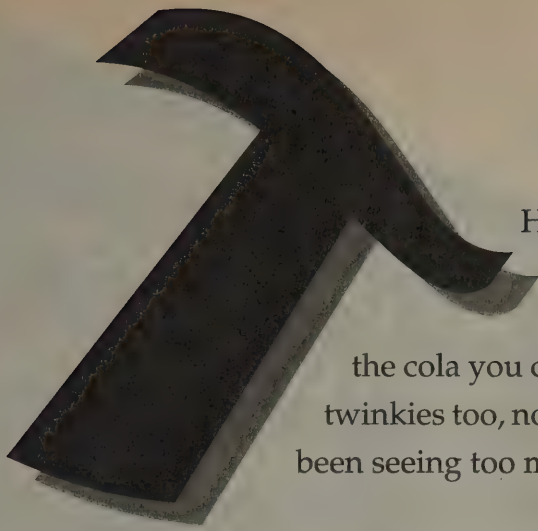
STEPHEN R. PETERSON © 1993



Bruce Sterling has MIRVed his career to quadruple threat: science-fiction author (my favorite still is *Schismatrix*); editor (of the defining cyberpunk collection, *Mirrorshades*); journalist (many magazine pieces and one book so far, *Hacker Crackdown*); and public speaking, at which he scintillates. This piece, approximately verbatim, is a talk he gave to the Computer Game Developers Conference, March 1991, in San Jose, California. Like many of the things he writes, it is available for free on the Internet. (To access from The Well: `g mondo then type texts` at the OK prompt.)

illustration by STEPHEN PETERSON

Sterling is currently at work on a disaster novel titled *Heavy Weather*, about high-tech storm-chase teams in a runaway greenhouse-effect world. Due eventually from Bantam.—SB



HANK YOU VERY MUCH FOR THAT INTRODUCTION. I'd like to thank the conference committee for their hospitality and kindness — all the cola you can drink — and mind you those were genuine twinkies too, none of those newfangled "Twinkies Lite" we've been seeing too much of lately.

So anyway my name is Bruce Sterling and I'm a science-fiction writer from Austin, Texas, and I'm here to deliver my speech now, which I like to call "The Wonderful Power of Storytelling." I like to call it that, because I plan to make brutal fun of that whole idea . . . In fact I plan to flame on just any moment now, I plan to cut loose, I plan to wound and scald tonight . . . Because why not, right? I mean, we're all adults, we're all professionals here . . . I mean, professionals in totally different arts, but you know, I can sense a certain simpatico vibe . . .

Actually I feel kind of like a mosasaur talking to dolphins here . . . We have a lot in common: we both swim, we both have big sharp teeth, we both eat fish . . . But you look like a broadminded crowd, so I'm sure you won't mind that I'm basically, like, *reptilian* . . .

So anyway, you're probably wondering why I'm here tonight, some hopeless dipshit literary author . . . and when am I going to get started on the virtues and merits of the prose medium and its goddamned wonderful storytelling. I mean, what else can I talk about? What the hell do I know about game design? I don't even know that the most lucrative target machine today is an IBM PC clone with a 16-bit 8088 running at 5 MHz. If you start talking about depth of play versus presentation, I'm just gonna to stare at you with blank incomprehension . . .

I'll tell you straight out why I'm here tonight. Why should I even try to hide the sordid truth from a crowd this perspicacious . . . You see, six months ago I was in Austria at this Electronic Arts Festival, which was a situation almost as unlikely as this one, and my wife Nancy and I are sitting there with William Gibson and Deb Gibson feeling very

cool and rather jetlagged and crispy around the edges, and in walks this *woman*. Out of nowhere. Like J. Random Attractive Redhead, right? And she sits down with her coffeecup right at our table. And we peer at each other's namebadges, right, like, *who is this person?* And her name is Brenda Laurel.

So what do I say? I say to this total stranger, I say, "Hey. Are you the Brenda Laurel who did that book on *the art of the computer-human interface?* You *are?* Wow, I loved that book." And yes — that's why I'm here as your guest speaker tonight, ladies and gentleman. It's because I can think fast on my feet. It's because I'm the kind of author who likes to hang out in Adolf Hitler's home town with the High Priestess of Weird.

So ladies and gentlemen unfortunately I can't successfully pretend that I know much about your profession. I mean actually I do know a *few* things about your profession . . . For instance, I was on the far side of the Great Crash of 1984. I was one of the civilian crashees, meaning that was about when I gave up twitch games. That was when I gave up my Atari 800. As to why my Atari 800 became a boat-anchor I'm still not sure . . . It was quite mysterious when it happened, it was inexplicable, kind of like the passing of a pestilence or the waning of the moon. If I understood this phenomenon I think I would really have my teeth set into something profound and vitally interesting . . . Like, my Atari still works today, I still own it. Why don't I get it out of its box and fire up a few cartridges? Nothing physical preventing me. Just some subtle but intense sense of revulsion. Almost like a Sartrean nausea. Why this should be attached to a piece of computer hardware is difficult to say.

My favorite games nowadays are SimCity, SimEarth and Hidden Agenda . . . I had Balance of the Planet on my hard disk, but I was so stricken with guilt by the digitized photo of the author and his spouse that I deleted the game, long before I could figure out how to keep everybody on the Earth from starving . . . Including myself and the author . . .

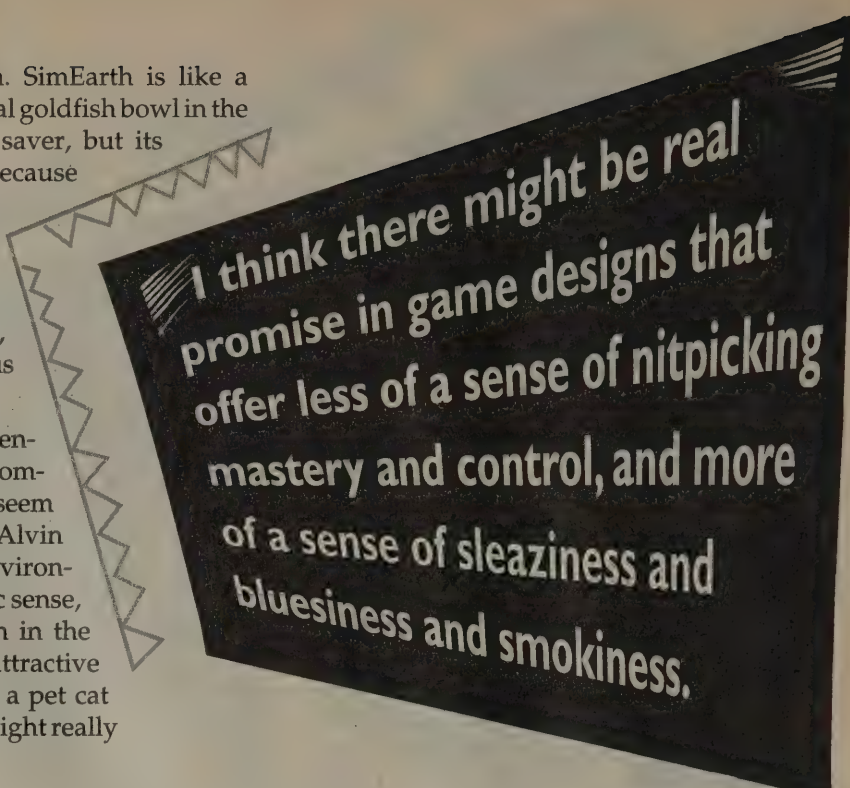
I'm especially fond of SimEarth. SimEarth is like a goldfish bowl. I also have the actual goldfish bowl in the "After Dark" Macintosh screen saver, but its charms waned for me, possibly because the fish don't drive one another into extinction. I theorize that this has something to do with a breakdown of the old dichotomy of twitch games versus adventure, you know, arcade zombie versus Mensa pinhead . . .

I can dimly see a kind of transcendence in electronic entertainment coming with things like SimEarth; they seem like a foreshadowing of what Alvin Toffler called the "intelligent environment" . . . Not "games" in a classic sense, but things that are just going on in the background somewhere, in an attractive and elegant fashion, kind of like a pet cat . . . I think this kind of digital toy might really go somewhere interesting.

What computer entertainment lacks most, I think, is a sense of mystery. It's too left-brain . . . I think there might be real promise in game designs that offer less of a sense of nitpicking mastery and control, and more of a sense of sleaziness and bluesiness and smokiness. Not neat tinkertoy puzzles to be decoded, not "treasure-hunts for assets," but creations with some deeper sense of genuine artistic mystery.

I don't know if you've seen the work of a guy called William Latham . . . I got his work on a demo reel from Media Magic. I never buy movies on video, but I really live for raw computer-graphic demo reels. This William Latham is a heavy dude . . . His tech isn't that impressive, he's got some kind of fairly crude IBM mainframe cad-cam program in Winchester, England . . . The thing that's most immediately striking about Latham's computer artworks — *ghost sculptures* he calls them — is that the guy really possesses a sense of taste. Fractal art tends to be quite garish. Latham's stuff is very fractally and organic, it's utterly weird, but at the same time it's very accomplished and subtle. There's a quality of ecstasy and dread to it; there's a sense of genuine enchantment there. A lot of computer games are stuffed to the gunwales with enchanters and wizards and so-called magic, but that kind of sci-fi mysticism seems very dime-store stuff by comparison with Latham.

I like to imagine the future of computer games as being something like the Steve Jackson Games bust by the Secret Service, only in this case what they were busting wouldn't have been a mistake, it would have been something actually quite seriously inexplicable and possibly even a genuine cultural threat . . . Something of the



I think there might be real promise in game designs that offer less of a sense of nitpicking mastery and control, and more of a sense of sleaziness and bluesiness and smokiness.

sort

may come from virtual reality. I rather imagine something like an LSD backlash occurring there; something along the lines of: "Hey we have something here that can really seriously boost your imagination!" "Well, Mr. Developer, I'm afraid we here in the Food Drug and Software Administration don't really approve of that." That could happen. I think there are some visionary computer police around who are seriously interested in that prospect; they see it as a very promising growing market for law enforcement, it's kind of their version of a golden vaporware.

I now want to talk some about the differences between your art and my art. My art, science-fiction writing, is pretty new as literary arts go, but it labors under the curse of three thousand years of literacy. In some weird sense I'm in direct competition with Homer and Euripides. I mean, these guys aren't in the SFWA, but their product is still taking up valuable rack-space. You guys on the other hand get to reinvent everything every time a new platform takes over the field. This is your advantage and your glory. This is also your curse. It's a terrible kind of curse really.

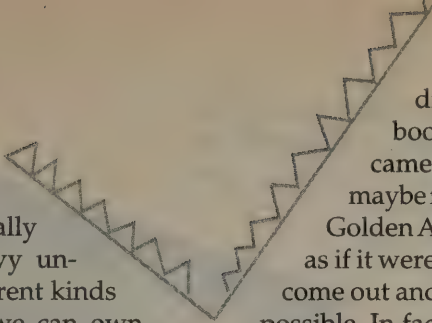
This is a lesson about cultural expression nowadays that has applications to everybody. This is part of living in the Information

Society. Here we are in the nineties; we have these tremendous information-handling, information-producing technologies. We think it's really great that we can have groovy unleashed access to all these different kinds of data, we can own books, we can own movies on tape, we can access databanks, we can buy computer games, records, music, art . . . A lot of our art aspires to the condition of software; our art today wants to be digital . . . But our riches of information are in some deep and perverse sense a terrible burden to us. They're like a cognitive load. As a digitized information-rich culture nowadays, we have to artificially invent ways to forget stuff. I think this is the real explanation for the triumph of compact disks.

Compact disks aren't really all that much better than vinyl records. What they make up in fidelity they lose in groovy cover art. What they gain in playability they lose in presentation. The real advantage of CDs is that they allow you to forget all your vinyl records. You think you love this record collection that you've amassed over the years. But really the sheer choice, the volume, the load of memory there is secretly weighing you down. You're never going to play those Alice Cooper albums again, but you can't just throw them away, because you're a culture nut.

But if you buy a CD player you can bundle up all those records and put them in attic boxes without so much guilt. You can pretend that you've stepped up a level, that now you're even more intensely into music than you ever were; but on a practical level what you're really doing is weeding this junk out of your life. By dumping the platform you dump everything attached to the platform and my god what a blessed secret relief. What a relief not to remember it, not to think about it, not to have it take up disk-space in your head.

Computer games are especially vulnerable to this because they live and breathe through the platform. But something rather similar is happening today to fiction as well . . . What you see in science fiction nowadays is an amazing tonnage of product that is shuffled through the racks faster and faster . . . If a science-fiction paperback stays available for six weeks, it's a miracle. Gross sales are up, but individual sales are off . . . Science fiction



didn't even used to be *published* in book form; when a science-fiction *book* came out it would be in an edition of maybe five hundred copies and these weirdo Golden Age SF fans would cling to every copy as if it were made of platinum . . . But now they come out and they are made to vanish as soon as possible. In fact to a great extent they're designed by their lame hack authors to vanish as soon as possible. They're cliches because cliches are less of a cognitive load. You can write a whole trilogy instead, bet you can't eat just one . . . Nevertheless they're still objects in the medium of print. They still have the cultural properties of print.

Culturally speaking they're capable of lasting a long time because they can be replicated faithfully in new editions that have all the same properties as the old ones. Books are independent of the machineries of book production, the platforms of publishing. Books don't lose anything by being reprinted by a new machine; books are stubborn; they remain the same work of art, they carry the same cultural aura. Books are hard to kill. *Moby Dick*, for instance, bombed when it came out; it wasn't until the 1920s that *Moby Dick* was proclaimed a masterpiece, and then it got printed in millions. Emily Dickinson didn't even publish books, she just wrote these demoted little poems with a quill pen and hid them in her desk, but they still fought their way into the world, and lasted on and on and on. It's damned hard to get rid of Emily Dickinson, she hangs on like a tick in a dog's ear. And everybody who writes from then on in some sense has to measure up to this woman. In the art of book-writing the classics are still living competition; they tend to elevate the entire art form by their persistent presence.

I've noticed though that computer-game designers don't look much to the past. All their idealized classics tend to be in reverse, they're projected into the future. When you're a game designer and you're waxing very creative and arty, you tend to measure your work by stuff that doesn't exist yet. Like now we only have floppies, but wait till we get CD-ROM. Like now we can't have compelling lifelike artificial characters in the game, but wait till we get AI. Like now we waste time porting games between platforms, but wait till there's just one standard. Like now we're just starting with huge multiplayer games, but wait till the modem networks are a happening thing. And I — as a game designer artiste — it's my solemn duty to carry us that much farther forward toward the beckoning grail . . .

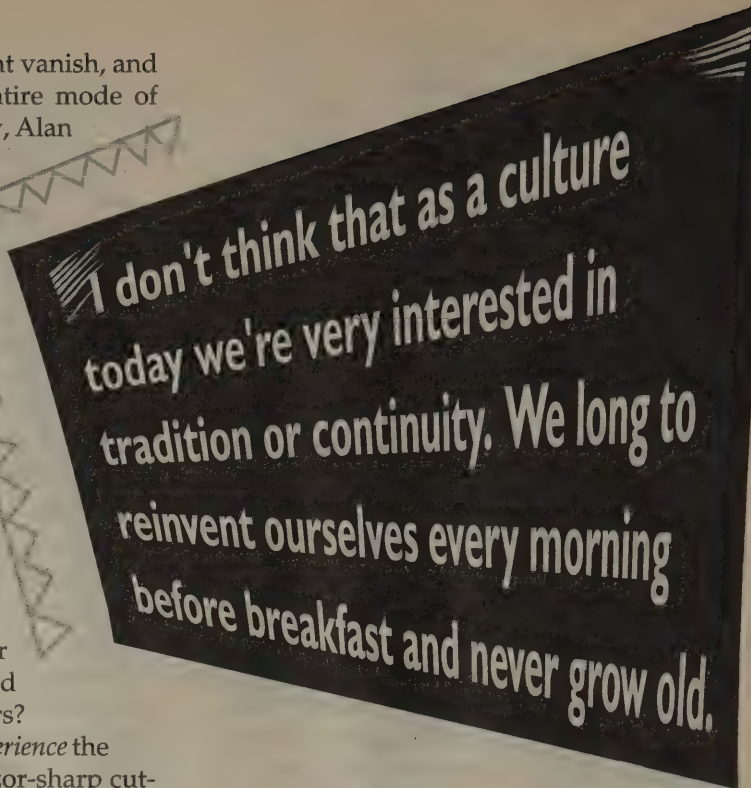
For a novelist like myself this is a completely alien paradigm. I can see that it's very seductive, but at the same time I can't help but see that the ground is crumbling under your feet. Every time a platform vanishes it's like a little cultural apocalypse. And I can imagine a

time when all the current platforms might vanish, and then what the hell becomes of your entire mode of expression? Alan Kay — he's a heavy guy, Alan Kay — he says that computers may tend to shrink and vanish into the environment, into the walls and into clothing . . . Sounds pretty good . . . But this also means that all the joysticks vanish, all the keyboards, all the repetitive strain injuries.

I'm sure you could play some kind of computer game with very intelligent, very small, invisible computers . . . You could have some entertaining way to play with them, or more likely they would have some entertaining way to play with you. But then imagine yourself growing up in that world, being born in that world. You could even be a computer game designer in that world, but how would you study the work of your predecessors? How would you physically *access* and *experience* the work of your predecessors? There's a razor-sharp cutting edge in this art form, but what happened to all the stuff that got sculpted?

As I was saying, I don't think it's any accident that this is happening . . . I don't think that as a culture today we're very interested in tradition or continuity. No, we're a lot more interested in being a New Age and a revolutionary epoch; we long to reinvent ourselves every morning before breakfast and never grow old. We have to run really fast to stay in the same place. We've become used to running; if we sit still for a while it makes us feel rather stale and panicky. We'd miss those sixty-hour work weeks.

And much the same thing is happening to books today too . . . Not just technically, but ideologically. I don't know if you're familiar at all with literary theory nowadays, with terms like deconstructionism, postmodernism . . . Don't worry, I won't talk very long about this . . . It can make you go nuts, that stuff, and I don't really recommend it, it's one of those fields of study where it's sometimes wise to treasure your ignorance . . . But the thing about the new literary theory that's remarkable, is that it makes a really violent break with the past . . . These guys don't take the books of the past on their own cultural terms. When you're deconstructing a book it's like you're psychoanalyzing it, you're not studying it for what it says, you're studying it for the assumptions it makes and the cultural reasons for its assemblage . . . What this essentially means is that you're not letting it touch you, you're very careful not to let it get its message through or affect you deeply or emotionally in any way. You're in a position of complete psychological and technical superiority to the book and its author . . . This



I don't think that as a culture today we're very interested in tradition or continuity. We long to reinvent ourselves every morning before breakfast and never grow old.

is a way for modern literateurs to handle this vast legacy of the past without actually getting any of the sticky stuff on you. It's like it's dead. It's like the next best thing to not having literature at all. For some reason this feels really good to people nowadays.

But even that isn't enough, you know . . . There's talk nowadays in publishing circles about a new device for books, called a ReadMan. Like a Walkman only you carry it in your hands like this . . . Has a very nice little graphics screen, theoretically, a high-definition thing, very legible . . . And you play your books on it . . . You buy the book as a floppy and you stick it in . . . And just think, wow you can even have graphics with your book . . . You can have music, you can have a soundtrack . . . Narration . . . Animated illustrations . . . Multimedia . . . it can even be interactive . . . It's the New Hollywood for Publisher's Row, and at last books can aspire to the exalted condition of movies and cartoons and TV and computer games . . . And just think: when the ReadMan goes obsolete, all the product that was written for it will be blessedly gone forever! Erased from the memory of mankind!

Now I'm the farthest thing from a Luddite ladies and gentlemen, but when I contemplate this particular technical marvel my

author's blood runs cold . . . It's really hard for books to compete with multisensory media, with modern electronic media, and this is supposed to be the panacea for withering literature, but from the marrow of my bones I say get that fucking little sarcophagus away from me. For God's sake don't put my books into the Thomas Edison kinoscope. Don't put me into the stereograph, don't write me on the wax cylinder, don't tie my words and my thoughts to the fate of a piece of hardware, because hardware is even more mortal than I am, and I'm a hell of a lot more mortal than I care to be. Mortality is one good reason why I'm writing books in the first place. For God's sake don't make me keep pace with the hardware, because I'm not really in the business of keeping pace, I'm really in the business of marking place.

Now I've sometimes heard it asked why computer game designers are deprived of the full artistic respect they deserve. God knows they work hard enough. They're really talented too, and by any objective measure of intelligence they rank in the top percentiles. . . I've heard it said that maybe this problem has something to do with the size of the author's name on the front of the game-box. Or it's lone wolves versus teams, and somehow the proper allotment of fame gets lost in the muddle. One factor I don't see mentioned much is the sheer lack of stability in your medium. A modern moviemaker could probably make a pretty good film with D. W. Griffith's equipment, but you folks are dwelling in the very maelstrom of Permanent Technological Revolution. And that's a really cool place, but man, it's just not a good place to build monuments.

Okay. I live in the same world you live in; I hope I've demonstrated that I face a lot of the same problems you face . . . Believe me, there are few things

deader or more obsolescent than a science-fiction novel that predicts the future when the future has passed it by. Science fiction is a pop medium and a very obsolescent medium. The fact that written science fiction is a prose medium gives us some advantages, but even science fiction has a hard time wrapping itself in the traditional mantle of literary excellence . . . We try to do this sometimes, but generally we have to be really drunk first. Still, if you want your work to survive (and some science fiction *does* survive, very successfully), then your work has to capture some quality that lasts. You have to capture something that people will search out over time, even though they have to fight their way upstream against the whole rushing current of obsolescence and innovation.

The Hacker Crackdown

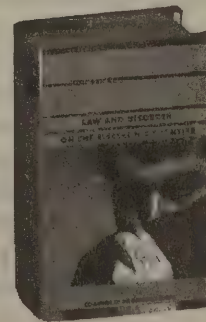
*Since the 1990s are loaded with real-life scenarios seemingly ripped from the pages of the most imaginative science fiction tomes of years past, who better to document our era's wooliest frontier — cyberspace — than our currently most imaginative SF scribe? Bruce Sterling is himself a character in **The Hacker Crackdown**, a sardonic, no-bullshit guide to the digital range wars between self-styled cyberpunk crackers and the cynically ambitious law enforcers who prosecute them. While his narrative is off-the-cuff and rambling, Sterling manages to bring perspective to the issue (his brief history of the phone company is priceless) and he really shines when puncturing the foibles of his subjects, on both sides of the law. **Crackdown** is not only an illuminating guide to the digital zeitgeist, but a great entertainment, loaded with barbed insights and smart-ass wisecracks. Think of it as *Fear and Loathing in Cyberspace*. —Steven Levy*

• There's a case on record of a single question — "How'd you do it?" — eliciting a forty-five-minute videotaped confession from a computer criminal who not only completely incriminated himself but drew helpful diagrams.

Computer people talk. Hackers brag. Phone phreaks talk *pathologically* — why else are they stealing phone codes, if not to natter for ten hours straight to their friends on an opposite seaboard? Computer-literate people do in fact possess an arsenal of nifty gadgets and techniques that would allow them to conceal all kinds of exotic skullduggery, and if they could only

shut up about it, they could probably get away with all manner of amazing information crimes. But that's just not how it works — or at least, that's not how it's worked so far.

Most every phone phreak ever busted has swiftly implicated his mentors, his disciples, and his friends. Most every white-collar computer criminal, smugly convinced that his clever scheme is bulletproof, swiftly learns otherwise when, for the first time in his life, an actual no-kidding police officer leans over, grabs the front of his shirt, looks him right in the eye, and says: "All right, asshole — you and me are going downtown!" All the hardware in the world will not insulate your nerves from those actual real-life sensations of terror and guilt.



The Hacker Crackdown

(Law and Disorder on the Electronic Frontier)

Bruce Sterling. Bantam Books, 1992; 340 pp.

\$23 (\$25.50 postpaid) from Bantam, Doubleday, Dell/Fulfillment Dept., 245 I S. Wolf Road, Des Plaines, IL 60018; 800/223-6834

And I've come up with a strategy for attempting this. Maybe it'll work — probably it won't — but I wouldn't be complaining so loudly if I didn't have some kind of strategy, right? And I think that my strategy may have some relevance to game designers so I presume to offer it tonight.

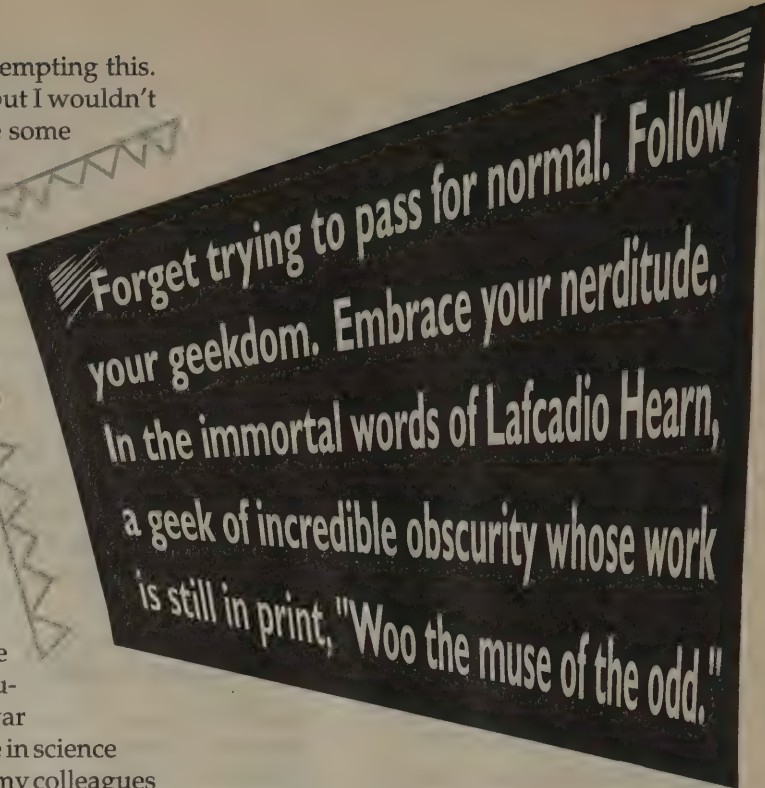
This is the point at which your normal J. Random Author trots out the doctrine of the Wonderful Power of Storytelling. Yes, storytelling, the old myth around the campfire, blind Homer, universal Shakespeare, this is the art ladies and gentlemen that strikes to the eternal core of the human condition . . . This is high art and if you don't have it you are dust in the wind . . . I can't tell you how many times I have heard this bullshit . . . This is known in my field as the "Me and My Pal Bill Shakespeare" argument. Since 1982 I have been at open war with people who promulgate this doctrine in science fiction and this is the primary reason why my colleagues in SF speak of me in fear and trembling as a big bad cyberpunk . . . This is the classic doctrine of Humanist SF.

This is what it sounds like when it's translated into your jargon. Listen closely:

"Movies and plays get much of their power from the resonances between the structural layers. The congruence between the theme, plot, setting, and character layouts generates emotional power. Computer games will never have a significant theme level because the outcome is variable. The lack of theme alone will limit the storytelling power of computer games."

Hard to refute. Impossible to refute. Ladies and gentlemen: to hell with the marvellous power of storytelling. If the audience for science fiction wanted *storytelling*, they wouldn't read goddamned *science fiction*, they'd read *Harpers* and *Redbook* and *Argosy*. The pulp magazine (which is our genre's primary example of a dead platform) used to carry all kinds of storytelling. Western stories. Sailor stories. Prizefighting stories. G-8 and his battle aces. Spicy Garage Tales. Aryan Atrocity Adventures. These things are dead. Stories didn't save them. Stories won't save us. Stories won't save *you*.

This is not the route to follow. We're not into science fiction because it's *good literature*, we're into it because it's *weird*. Follow your weird, ladies and gentlemen. Forget trying to pass for normal. Follow your geekdom. Embrace your nerditude. In the immortal words of Lafcadio Hearn, a geek of incredible obscurity whose work is still in print after a hundred years, "Woo the muse of the odd." A good science-fiction story is not a



Forget trying to pass for normal. Follow your geekdom. Embrace your nerditude. In the immortal words of Lafcadio Hearn, a geek of incredible obscurity whose work is still in print, "Woo the muse of the odd."

"good story" with a polite whiff of rocket fuel in it. A good science-fiction story is something that knows it is science fiction and plunges through that and comes roaring out of the other side. Computer entertainment should not be more like movies, it shouldn't be more like books: it should be more like computer entertainment, *so much more like computer entertainment that it rips through the limits and is simply impossible to ignore!*

I don't think you can last by meeting the contemporary public taste, the taste from the last quarterly report. I don't think you can last by following demographics and carefully meeting expectations. I don't know many works of art that last that are condescending. I don't know many works of art that last that are deliberately stupid. You may be a geek, you may have geek written all over you; you should aim to be one geek they'll never forget. Don't aim to be civilized. Don't hope that straight people will keep you on as some kind of pet. To hell with them; they put you here. You should fully realize what society has made of you and take a terrible revenge. Get weird. Get way weird. Get dangerously weird. Get sophisticatedly, thoroughly weird and don't do it halfway, put every ounce of horsepower you have behind it. Have the artistic *courage* to

recognize your own significance in culture!

Okay. Those of you into SF may recognize the classic rhetoric of cyberpunk here. Alienated punks, picking up computers, menacing society . . . That's the cliched press story, but they miss the best half. Punk into cyber is interesting, but cyber into punk is way dread. I'm into technical people who attack pop culture. I'm into techies gone dingo, techies gone rogue — not street punks picking up any glittery junk that happens to be within their reach — but disciplined people, intelligent people, people with some technical skills and some rational thought, who can break out of the arid prison that this society sets for its engineers. People who are, and I quote, "dismayed by nearly every aspect of the world situation and aware on some nightmare level that the solutions to our problems will not come from the breed of dimwitted ad-men that we know as politicians." Thanks, Brenda!

That still smells like hope to me . . .

You don't get there by acculturating. Don't become a well-rounded person. Well-rounded people are smooth and dull. Become a thoroughly spiky person. Grow spikes from every angle. Stick in their throats like a pufferfish. If you want to woo the muse of the odd, don't read Shakespeare. Read Webster's revenge plays. Don't read Homer and Aristotle. Read Herodotus where he's off talking about Egyptian women having public sex with goats. If you want to read about myth, don't read Joseph Campbell, read about convulsive religion, read about voodoo and the Millerites and the Munster Anabaptists. There are hundreds of years of extremities, there are vast legacies of mutants. There have always been geeks. There will always be geeks. Become the apotheosis of geek. Learn who your spiritual ancestors were. You didn't come here from nowhere. There are reasons why you're here. Learn those reasons. Learn about the stuff that was buried because it was too experimental or embarrassing or inexplicable or uncomfortable or dangerous.

And when it comes to studying art, well, study it, but study it to your own purposes. If you're obsessively weird enough to be a good weird artist, you generally face a basic

problem. The basic problem with weird art is not the height of the ceiling above it, it's the pitfalls under its feet. The worst problem is the blundering, the solecisms, the naïveté of the poorly socialized, the rotten spots that you skid over because you're too freaked out and not paying proper attention.

You may not need much characterization in computer entertainment. Delineating character may not be the point of your work. That's no excuse for making lame characters that are actively bad. You may not need a strong, supple, thoroughly worked-out storyline. That doesn't mean that you can get away with a stupid plot made of chickenwire and spit. Get a full repertoire of tools. Just make sure you use those tools to the proper end. Aim for the heights of professionalism. Just make sure you're a professional *game designer*.

You can get a hell of a lot done in a popular medium just by knocking it off with the bullshit. Popular media always reek of bullshit, they reek of carelessness and self-taught clumsiness and charlatanry. To live outside the aesthetic laws you must be honest. Know what you're doing; don't settle for the way it looks just 'cause everybody's used to it. If you've got a palette of two million colors, then don't settle for designs that look like a cheap four-color comic book. If you're gonna do graphic design, then learn what good graphic design looks like; don't screw around in amateur fashion out of sheer blithe ignorance. If you write a manual, don't write a semiliterate manual with bad grammar and misspellings. If you want to be taken seriously by your fellows and by the populace at large, then don't give people any excuse to dismiss you. Don't be your own worst enemy. Don't put yourself down.

I have my own prejudices and probably more than my share, but I still think these are pretty good principles. There's nothing magic about 'em. They certainly don't guarantee success, but there's "success" and then there's success. Working seriously, improving your taste and perception and understanding, knowing what you are and where you came from, not only improves your work in the present, but gives you a chance of influencing the future and links you to the best work of the past. It gives you a place to take a solid stand. I try to live up to these principles; I can't say I've mastered them, but they've certainly gotten me into some interesting places, and among some very interesting company. Like the people here tonight.

I'm not really here by any accident. I'm here because I'm *paying attention*. I'm here because I know you're significant. I'm here because I know you're important. It was a privilege to be here. Thanks very much for having me, and showing me what you do.

That's all I have to say to you tonight. Thanks very much for listening. 🐼

Music From Inside Virtual Reality

Program Notes:

A live improvisation on musical instruments that exist only in virtual reality. The piece is performed by a single hand in a DataGlove. The audience sees a projection of the performer's point of view.

The instruments are somewhat autonomous, and occasionally fight back.

The music changes dramatically from one performance to the next.

The piece also demonstrates a variety of interface designs for handheld virtual tools.

The Sound of One Hand

BY ARON LANIER



The Cybersax is perhaps the most sophisticated virtual hand tool yet designed. A musician can play over a large range (sometimes two melodies at once), while simultaneously controlling the mix of the music and a large number of parameters of timbre, volume, and placement of the tone.

The primary purpose isn't to be able to do many things at once, of course. The purpose is to play music in an intensely gestural style.

THE CONTEXT: The first four performances of *The Sound of One Hand* took place on July 28 through 30, 1992, during the "Electronic Theater" at SIGGRAPH, in the Aerie CROWN Theater in Chicago, a 5,000-seat hall (it was packed each time). I'm working on a full-length concert version, and Point Records (a new part of PolyGram, organized by Philip Glass and devoted to experimental music) will bring out a record of the music in 1993.

The following notes were written to accompany a video of the performance:

I STARTED ON THE DESIGN of the Virtual World for *The Sound of One Hand*, and on learning how to play it, only a month before the performance, so I had to become completely immersed in the creation process.

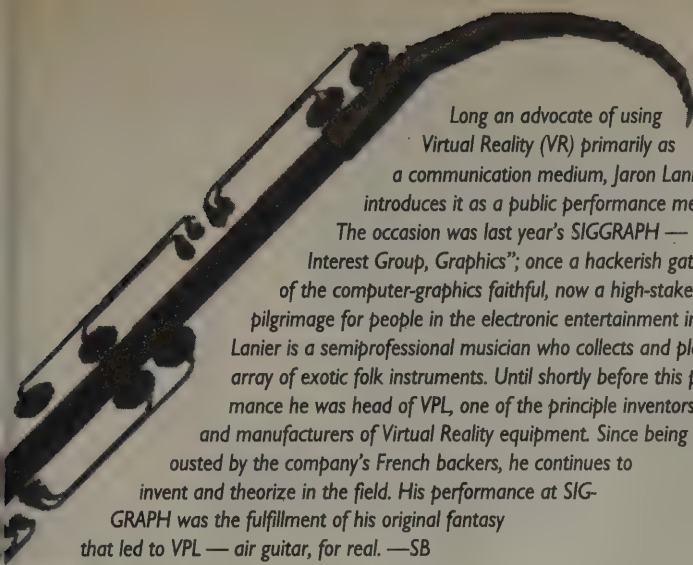
I had originally thought the piece would be an elaborate VR "demo," or explication, with clear visual cues for the music, easy-to-use interfaces, and lots of funny Rube Goldberg tricks. But as I worked on

the World, a mood, or an essence, started to emerge, and it was true to my emotional and spiritual experience at the time. This was unexpected and exciting, even if the content was not cheerful. So I went with a darker and more intuitive process instead of falling in line with the familiar computer culture of clarity and light humor. There have only been rare occasions when I felt I was programming in an intuitive way, and this was one.

Don't expect the instruments to be immediately understandable, or imagine that they are easy to play.

They emerged from a creative process I cannot fully explain, and I had to learn to play them. I don't think the two esthetics I'm distinguishing must be mutually exclusive, but the intuitive side of the equation can't reliably be willed into action. A synthesis of clarity and mood will come by grace, when it comes.

The first instrument is called the



Long an advocate of using Virtual Reality (VR) primarily as a communication medium, Jaron Lanier here introduces it as a public performance medium. The occasion was last year's SIGGRAPH — "Special Interest Group, Graphics"; once a hackerish gathering of the computer-graphics faithful, now a high-stakes annual pilgrimage for people in the electronic entertainment industry. Lanier is a semiprofessional musician who collects and plays a vast array of exotic folk instruments. Until shortly before this performance he was head of VPL, one of the principle inventors and manufacturers of Virtual Reality equipment. Since being ousted by the company's French backers, he continues to invent and theorize in the field. His performance at SIGGRAPH was the fulfillment of his original fantasy that led to VPL — air guitar, for real. —SB

Rhythm Gimbal. A gimbal is a common mechanical construction, a hierarchy of rotating joints. The Rhythm Gimbal resembles a gyroscope. When it is still it is completely white and completely silent. When I pick it up and move it, it begins to emit sound. The sound is created by the rings rubbing against each other — they also change color at contact. Once set in motion, the Rhythm Gimbal will slow down, but will take a long time to stop completely. If I give the Rhythm Gimbal a good spin as I release it, it emits an extra set of noises which are more tinkly, and which slow down as the instrument winds down. Thus, unless I am careful to release it without any spin, it will continue to make sounds when I'm not looking at it. The "background" sound heard while I am playing the other instruments comes from the Rhythm Gimbal.

The primary (non-tinkly) Rhythm Gimbal sound is a combination of a choir, an orchestra and some other stuff. The harmony is generated by the momentum with which internal parts of the instrument hit each other after it has been released by the hand: each ring transmits spin to the ring outside it, creating a

complex motion, like pendulums hung on pendulums. The rings have beads on them. When the beads collide, they change color, and also cause a change in harmony. You know those old attractions at amusement-park arcades, where you hammer a target on the ground with a giant mallet and see how high you can send a puck on a big vertical ruler? The internal collisions of the Rhythm Gimbal fling virtual pucks around the circle of fifths, and then up the harmonic series, in much the same way. A note is added to the harmony when the two types of puck reach it approximately at once. All the harmony and rhythmic texture come out of this process.

But the Gimbal can't properly be described as an algo-rhythmic music generator. For example, I don't think an explicit style of initialization could be used to find the right parameters to make it sing. There is a necessary element of intuitive performance in the weird harmonies of this curious instrument.

Every note of the piece is generated by my hand movements, as they are transmitted through the virtual instruments: There are no predetermined sequences or groupings of notes; the musical content is entirely improvised, with the exception of the timbral range

of the instruments.

This does not mean that I can make any arbitrary music, any more than I could with any other musical instruments. I can't get a specific chord out of the Rhythm Gimbal reliably. But I can get a *feel* out of a chord progression, because I can influence when chords change and how radical the change will be. This does not feel like less control to me, but rather like a different kind of control. The test of an instrument is not what it can do, but: can you become infinitely more sensitive to it as you explore and learn? A piano is like this. A good instrument has a depth that the body can learn and the mind cannot. I believe it is entirely possible for the mind to invent such instruments.

Hidden mechanisms in Virtual Reality are just invisible objects. While I was developing this World, I would make the harmonic structure visible — it looks like a bunch of notes crawling on rings and up a pole. But I made it mostly invisible for the performance as a visual design decision. One part is still visible, though: a large blue ring with tuning forks on it. Each of the tuning forks has a T-shaped thing on the base and rings on the arms. These objects store the current legal tonic and chords for progressions; you can see them moving as the harmony changes.

The CyberXylo is a mallet instrument. Its notes are taken from the tuning forks on the blue ring, so it is always harmonious with the Rhythm Gimbal. The mallet retains angular momentum, with some friction, when it is released. Thus it is possible to set it spinning so that it will continue to hit the keys of the CyberXylo on its own for a while. The spin is of poor mathematical quality: it increments rotations instead of using quaternions. This creates wild, unnatural spinning patterns. With



Kevin Kelly

Jaron Lanier and his articulated cargo-cult Thai saxophone.

practice, enthusiastic spins of the mallet close to the keys can be a source of remarkable rhythms.

The Cybersax is the most ergonomically complex instrument. When the instrument is grabbed, it turns to gradually become held correctly by your hand, and tries to avoid passing through fingers on the way. Once you are holding it, the positions of your virtual fingers continue to respond to your physical ones, but are adjusted to be properly placed on the sax keys. This is an example of a "simulation of control" that is critical in the design of virtual hand tools, especially when force-feedback is not available.

Three musical registers — soprano, alto, and bass — are located along the main tube. Each register consists of a set of shiny sax-like keys. The notes played by the keys come from the current set of legal notes defined by the Rhythm Gimbal, so it will not clash with the other

instruments. It is possible to slide between registers by jerking the hand toward a targeted register. The momentum of your slide helps determine which notes will be associated with the keys until you slide again (if, for example, you approach the soprano register from the alto with greater force you will choose a set of notes that are higher up in pitch). You can play freely without dropping the horn by mistake (this was a hard quality to achieve). In the upper register, it is possible to play two melodies at once by modulating with the thumb. The orientation of the horn in space controls the timbre, mix, and other properties of the sound. Other design elements include the obscene, wagging tail/mouthpiece and the throbbing bell.

The Cybersax sound and geometric construction were partly inspired by a bizarre bamboo saxophone I have that came from Thailand. It is jointed at the top, just like the Cybersax's tail.

Computer music must use instruments built out of concepts of what music is. This is a drastic departure from the "dumb" instruments of the past. A piano doesn't know what a note is, it just vibrates when struck. A sensitivity to, and a sense of awe at, the mystery that surrounds life is at the heart of both science and art; instruments with mandatory concepts built in can dull this sensitivity by providing an apparently non-mysterious setting for activity. This can lead to "nerdy" or bland art. It is interesting to hide oneself behind a piano, as opposed to a computer, but only because a piano is made of resonant materials, not of concepts. In order for computer art, or music, to work you have to be extra-careful to put people and human contact at the center of attention.

I was delighted to discover that *The Sound of One Hand* created an unusual status relationship between the performer, the audience, and the technology. The usual use of rare

The Sound of One Hand

Performed by Jaron Lanier

July 30, 1992

SIGGRAPH Electronic Theater

Aerie CROWN Theater

Chicago, Illinois

World and Music	Jaron Lanier
System and Show Support	Dale McGrew
Synth and Sound Engineer	Alfred "Shabba" Owens
Body Electric (world design and control tool)	Chuck Blanchard, David Levitt
Isaac (real-time graphics software)	Ethan Joffe, Chris Paulicka
World Test Intern (Gimbal Spinner)	Rolf Rando
EyePhones, DataGlove, development software	VPL Research, Inc.
Graphics Engine (440VGXT)	Silicon Graphics, Inc.
Info on VR products used in The Sound of One Hand:	VPL Research, Inc. 950 Tower Lane, 14th Floor Foster City, CA 94404 (415) 312-0200 fax (415) 312-9356

and expensive high technology in performance is to create a spectacle that elevates the status of the performer. The performer is made relatively invulnerable, while the audience is supposed to be awestruck. This is what rock concerts and the Persian Gulf War have in common.

The Sound of One Hand creates quite a different situation. The audience watches me contort myself as I navigate the space and handle the virtual instruments, but I am wearing EyePhones. Five thousand people watch me, but I can't see them, or know what I look like to them. I was vulnerable, despite the technology. This created a more authentic setting for music. If you have played music, especially improvised music, in front of an audience, you know the kind of vulnerability I am talking about, the vulnerability that precedes

an authentic performance.

About that contorting . . . I used point-flying in the performance. This is a technique of navigating where you point with your hand to where you want to go and this causes you to fly there. I dislike point-flying in industrial applications of VR — it requires skill and uses up your hand. I used it in this case because I *did* want the unconstrained, skillful type of navigation; it allowed me to choreograph a tour of the Virtual World's asteroid along with the performance. I was shocked and embarrassed when I got lost in my own World during one of the performances!

Another human element of the piece is its physicality. *The Sound of One Hand* is in the tradition of the theremin in that the interface is primarily physical instead of men-

tal. Although the instruments were made of information, the music was primarily made of gesture.

The equipment I used was, for the most part, not state-of-the-art, but about a year out of date. The synthesizers and Head Mounted Display were '92 models, but the graphics engine, tracker and DataGlove were all older. I think you have to actively avoid using the latest gear in doing art, to avoid getting caught up in technology for its own sake.

The software was quite current, however. The piece was written entirely in Body Electric, a visual programming language for Virtual Reality. I am extremely fond of this software working environment, which was designed primarily by Chuck Blanchard. You hook up visual diagrams to control what happens in the Virtual World and see the effect immediately. All the music and physics were done in Body Electric; I could never have made this thing in C.

Visually and sculpturally, the World took advantage of every trick then available for real-time rendering, including radiosity, fog, texture mapping, environment mapping, and morphing. The color "flaking" effect resulted from a bug seen when the color of hardware fog on the graphics engine was gradually changed (I set up a very slow-moving bouncing ball in the cylinder of red/green/blue color space as a chooser for the fog color). I sculpted all the parts of the World except for the illuminated skeletal hand that sprouts from the asteroid wall — which is from a Magnetic Resonance scan of a patient's hand taken at the Veterans Administration hospital in Palo Alto. It was originally used in research on surgical simulation.

The asteroid is hollow, and about twelve feet in diameter, although the dense fog makes it look and feel immense. It has a big crack in the side, through which fireflies frolic, and a big red ginger plant growing inside, and also a few spotlights. The instruments are generally kept inside. At one point in the performance I spun the Gimbal and flew out through the crack for a while to let the audience see how lonely the asteroid was, surrounded by absolute void.

The sounds were created on two sampler/synthesizers. I decided not to use the wonderful 3D sound capabilities of the Virtual Reality, since they are intended primarily for headphone use, and I didn't want the audience to be *trying* to hear something.

In many ways, *The Sound of One Hand* was a bigger leap into the unknown than all of the weird "experimental" performances I had been involved in in New York in the late seventies. I had no idea if the piece would take on a mood or meaning, or if the audience would find the experience comprehensible. The performance turned out to be a cheerful, therapeutic event for me. It was a sort of a technological blues, a bleak work that I could play happily. It was a chance to work on a purely creative project with the VPL family, a chance to treat all of VPL's stuff as a given set of (reliable!) raw materials instead of as work to do, a chance to practice what I preach about virtual tool design, a chance to use VR just for beauty, and a chance to be musical in front of my ridiculously political professional peer community. It was also a celebration of not having to run VPL anymore. The audiences were incredibly responsive, and I didn't hear anyone describe the piece as a demo. It was experienced as music. ♪

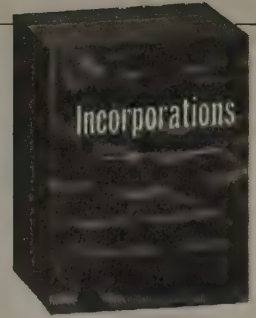
Incorporations

A collection of essays, more than anything, provides the willing generalist with a great excuse for drawing connections between ideas which, had they never been presented together, may never have found their way onto the same line of inquiry.

The organizing principle of *Incorporations* is the very principle of incorporation, and how it relates to that increasingly ambiguous interface between life and, well, non-life. Editors Cray and Kwinter have assembled a wide variety of views on the subject of humanity and its complex relationship to technology and information, ranging from a critique of the movie *Robocop* to a consideration of the quarantine procedures used on returning Apollo astronauts, from the history of prosthetic devices to a modernist perspective on neurasthenia. While the individual essays, drawings and photographs come from some of our most engaging social and scientific theorists, the volume derives its power from the clever juxtaposition of seemingly unrelated topics, so that we may realize a deeper meta-symbolism of the very nature of incorporation. —Douglas Rushkoff

■ **Personal computers** Perhaps unwisely, the brain is subcontracting many of its core functions, creating a series of branch economies that may one day amalgamate and mount a management buy-out.

■ **Apollo mission** The first demonstration, arranged for our benefit by the machine, of the dispensability of man. —J. G. Ballard,



Incorporations (Zone #6)

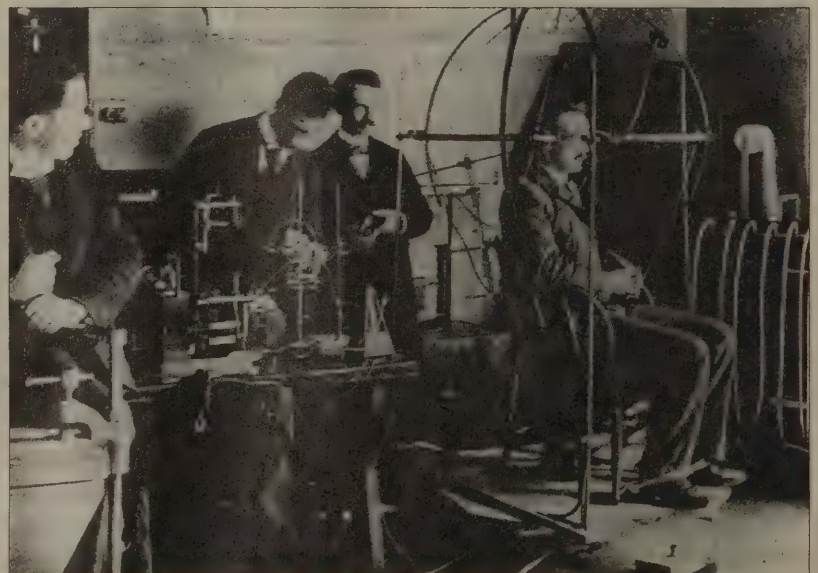
Jonathan Cray and Sanford Kwinter, Editors. Zone Books, 1992; 648 pp.

\$34.95 (\$37.95 postpaid) from The MIT Press/Order Dept., 55 Hayward Street, Cambridge, MA 02142; 800/356-0343

"Project for a Glossary of the Twentieth Century"

■ In the strongest possible sense, Onco-Mouse™ is a technological product whose natural habitat and evolutionary future are fully contained in that world-building space called "the laboratory." Denizen of the wonderful realms of the undead (where better things for better living come to life), this little murine smart bomb is also, in the strongest possible sense, a cultural actor. A tool-weapon for stalking cancer, the bioengineered mouse is simultaneously a metaphor and a technology. This is the normal state of the entities in technoscience cultures, including ourselves.

—Donna Haraway,
"When Man™ is on the Menu"



Sound localization experiment, 1890s.

Snow Crash

Not since *Neuromancer* has a cyberpunk novel generated such a buzz. Set in a not-terribly-distant future where America is good at only two things — software and quick pizza delivery — *Snow Crash* is a rollicking, frightening, tongue-in-cheek chronicle of a charming hacker and info-gatherer named Hiro Protagonist and his sometimes sidekick, a fifteen-year-old female skate ninja named Y.T.

Literary content? Roughly, Gibson/Sterling crossed with Tom Robbins. Idea content? Off the charts. Stephenson seems to have swallowed whole the available body of virtual-reality lit, a shelfful of manga and the Apple Human Interface Guidelines. He gives it back to us in an impressively coherent view of a future that merges a gaudy gestalt of fast-food-franchising run amok (the Mafia and Hong Kong have outposts on every Miracle Mile) with a rather instructive vision of an alternate reality called the Metaverse.

Forget the Information Highway — the real virtual public-works project will be to build the equivalent of what Stephenson calls "the Street," a limitless staging ground for everyone's alter ego. —Steven Levy

Hiro's avatar just looks like Hiro, with the difference that no matter what Hiro is wearing in Reality, his avatar always wears a black leather kimono. Most hacker types don't go in for garish avatars, because they know that it takes a lot more sophistication to render a realistic human face than a talking penis. Kind of the way people who really know clothing can appreciate the fine details that separate a cheap gray wool suit from an expensive hand-tailored gray wool suit.

You can't just materialize anywhere in the Metaverse, like Captain Kirk beaming down from on high. This would be confusing and irritating to the people around you. It would break the metaphor. Materializing out of nowhere (or vanishing back into Reality) is considered to be a private function best done in the confines of your own House. Most avatars nowadays are anatomically correct, and naked as a babe when they are first created, so in any case, you have to make yourself decent before you emerge onto the Street. Unless you're something intrinsically indecent and you don't care.



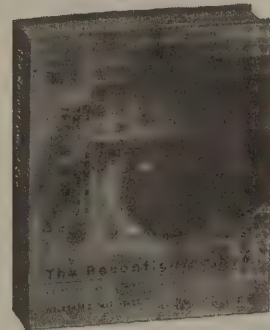
Collage can destroy the photograph's strict Aristotelian unities of place and time: Louis Armstrong (filmed in *High Society*) meets Elton John in a 1991 Diet Coke commercial.

The Reconfigured Eye

Here, academicked half to death, is a whole book on the subject of a cover story in the July 1985 *Whole Earth Review* — digital retouching of photographs, or, as this book subtitled it, "Visual Truth in the Post-Photographic Era." It serves as an edifying survey of computer techniques for manipulating images. —SB

In 1991 *Star Wars* director George Lucas suggested that colorization was only, in fact, the tip of the iceberg:

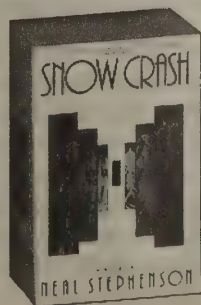
"The agonies filmmakers have suffered as their work is chopped, tinted and compressed are nothing compared to what technology has in store. . . . Unless the United States achieves uniformity with the rest of the world in the protection of our motion picture creations, we may live to see them recast with stars we



The Reconfigured Eye

William J. Mitchell, 1992; 273 pp.
\$39.95 (\$42.95 postpaid) from The MIT Press/Order Dept., 55 Hayward Street, Cambridge, MA 02142; 800/356-0343

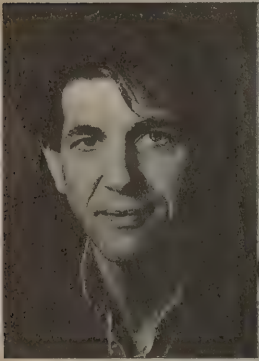
never directed, uttering dialogue we never wrote, all in support of goals and masters we never imagined we would serve."



Snow Crash

Neal Stephenson.
Bantam Books, 1992; 440 pp.
\$10 (\$12.50 postpaid) from Bantam, Doubleday, Dell/Fulfillment Dept., 2451 S. Wolf Road, Des Plaines, IL 60018; 800/223-6834

An Acting Lesson



Greg Gorman

from Peter Coyote

In 1968 he was one of the Diggers, the most radical and most radically creative group in San Francisco's Haight Ashbury renaissance, scrounging free food and distributing it to the masses. He had been an actor with the famed San Francisco Mime Troupe, performing hilarious agit-prop in the parks. In the mid-seventies Governor Jerry Brown appointed him head of the California Arts Council, where he successfully brought together the most conservative and most populist wings of the arts community. Poet Gary Snyder, his predecessor in the job, said he deserved a medal and a halo for what he accomplished.

By the end of the seventies he was building a career as a movie and television actor, eventually starring in dozens of films, such as *E.T.*, *Jagged Edge*, *A Man in Love*, and *Outrageous Fortune*. Current projects include *Bitter Moon* (by Roman Polanski) and *The Killer's Toenails* (title role).

A couple years ago I wasn't seeking an acting lesson. I just needed some advice on radio performance. NPR had me taping short essay-style commentaries for "Fresh Air," and I was doing them awkwardly. When Peter Coyote offered to give me advice, I rushed to his office for a session. He began by having me read aloud the next piece I planned to deliver. It was a busy little screed about architects making buildings that don't work. I read it with my customary clumsiness . . . —SB



Peter Coyote: I really like that piece. Okay. I can see three areas where you might want to play a little bit. In

the first place, it's good prose, but it hasn't been written to be read aloud. So all those little places where you stumbled and laughed, you should look at those as object lessons. Let's go through it sentence by sentence, and find what's a literary sentence and what's an oral sentence.

"It seems that architects as a profession are becoming almost as despised as lawyers and doctors." All right. That seems pretty straightforward. Maybe you don't even need "as a profession" or "it seems": "Architects are becoming almost as despised as lawyers and doctors." That's a conversational sentence to me. Now this one: "Architects tend to focus primarily on questions of style, while those of us who have to use buildings are so insensitive that all we care about is whether the building works." To me, that's a literary sentence.

I would try the superfluous-word exercise. I'm not saying this to correct the prose; I'm just saying that all of these shadings and nuances which the voice carries, we abandon when we write prose. "Tend," "questions of," "are so insensitive." You're a complicated person, so you're making a delicate joke here. But you've made the joke in a literary fashion instead of in a verbal fashion. Do you agree?

Stewart Brand: Yeah. If I can't do it with my voice, what's the point?

Coyote: I would give each sentence the reading test, and when you stumble or you find that you're strained or you're reading through too quickly, I would try to simplify it. Most newscasters and most commentators on the radio write like you did. It's witty, it's elegant, and most of the puns and jokes are literary. It doesn't sound like spoken speech.

Another thing: We hear in images. We don't hear in words. So it wasn't until you got into things like "The doors don't work right, the hallways are too narrow, the central heating and cooling don't work" that I could really follow you. I think that every time that you can use a good noun and a good verb, you've hooked the listener.

Your second problem was related to the first problem, and it was a pronunciation problem. You gave yourself tongue-twisters like "an environmental."

Brand: I actually wrote "gloved display hand" in one of these things. Impossible to say aloud. I have a feeling that one would not naturally speak words like that because your voice won't let you do it.

Coyote: Do you know the great singing-bad exercise? You get someone in acting class and tell them, "I'd like you to sing this song now, as badly as you can." And then they do it and you say, "No no, you can do worse than that. I'm sure you can do worse than that." Until finally they have let it all go, and we've displaced the question of vanity in the acting class. The truth is that we all try to be good in what we do, and so we all try to be smart, we all try to be witty, and we all try to be talented. Especially guys like us.

I think it's smarter to know when to be dumb. Everybody knows you're smart, everybody knows you're on the cutting edge of all this technology. So, if you can come out and sound like Senator Sam Ervin, you know, or like your dry, laconic style on *The WELL* — you always knock me out; I run twelve paragraphs, and you find the one tersest way of countering — that's your voice. I think you ought to bring that voice to these commentaries, and the more accurately you write that voice, and it reflects your inner sentiments, the more easily you'll read it.

Now, you're reading quickly, and the sentences run on and are not broken into conversational bites. Conversation is organized by the breath, just like bebop. *Breath*, and now I organize a series of thoughts or images between those breaths, *take another breath*, and I do another one. That's what bop prosody is, with Allen Ginsberg and the beat poets, that's what Charlie Parker did, and that's what human beings do.

One more thing. When you were reading, you were fronting an oddity, which leads me to question the persona who's reading. Every good comedian, every good clown, develops a persona that they speak through. Charlie Chaplin:



case in point. It's not necessary unless you're going to be an artist. It's useful sometimes, but it's also limiting. Geniuses develop personas that don't limit them.

Brand: I'd like to develop a good verbal persona.

Coyote: Why?

Brand: It's a . . . well . . . I want to say bottleneck. The function of a bottleneck is to keep you from getting all wet when you're drinking. It slows down the material and organizes it.

Coyote: Okay. Let me give you another way to think about it. I'm not going to counter that and say it's a bad idea, but I think there's a more guts-ball way to do it. I'm going to give you the parable on acting. You know [famous actress's] acting? Did you see [movie about a famous woman]?

Brand: Yes.

Coyote: Perfect example of completely uninteresting acting. And the reason it was uninteresting is because [the actress] herself was always judging the character. She was always standing back, as the puppet master, showing you, the audience, what was going on. And as such she was always in the bottleneck. So when [the character] was sad, [the actress] showed you sadness.

And when she was intent, she showed you intentness. And she always showed you one fucking thing at a time. Right? Boring.

Now, to counter that is someone like Meryl Streep. Who is like *right there*. When a character has an accent, you just learn the accent. If it has dark hair, you just make your hair dark. You take care of all the physical stuff, just get it out of the way. But what you're left with then are the sensibilities of the artist in the moment. And the more fully they bring themselves into that moment, the braver, and the more honest, and the more complicated they are.

Bob Duvall once said to me, "Hey, if I'm sitting at a table and I'm watching a fly on the sugar bowl, am I watching or is the character watching?" Who cares? As long as you're *really* there watching. The script says you're a doctor, or a Mafia lawyer. You can't watch a fly like a Mafia lawyer, right? All you can do is watch a fly.

What the persona does is, it becomes like a mask; it reduces the amount of presence that you can actually bring to bear. It's a kind of protection. It gives you control, it gives you a feeling of distinction and difference from the audience and lets you feel like an artist. What it never is, is complex and contra-

dictory — unless you're in the realm of real genius.

So, my suggestion to you would be to try the following exercises. Instead of offering an attitude — and this is the way I work as an actor — take a breath, let it out, and whatever feeling you find at the bottom of the breath, read that in the line. Maybe the feeling will come from the line. [Coyote reads a bad line from the essay with surprising warmth.] I'm not saying this is great drama. But what it is is one-to-one with what I'm feeling. I'm not putting forth an attitude. Therefore, whatever I'm feeling can come out. I noticed that when you were reading, you were putting out this sort of wise-guy persona, and I didn't like it. You reminded me of a movie critic — these guys that stand back and they're always kind of showing you how smart they are.

What's interesting to me about you as a human being is that you are extraordinarily unjudgmental and extraordinarily curious. You look at the world in a very phenomenological way and you don't judge it. You just kind of experience what it is and you go into it, and you're also enthusiastic. So, why not be that in front of an audience? Why not be that naked and give them the benefit of the doubt that they'll respond to you

just like I do and just like your friends do?

I'm suggesting that the persona is a self-conscious response that we all do—we all have little tricks that we run when we get insecure. But behind those tricks is a self-judgment, is a self-derogation, that somehow who we are is not worthy. This is what Carlos Castaneda was getting at when he said, "The self just presents itself." You've spent a lifetime at it and Stewart Brand leaks out of everything you do. Effortlessly. Now, if you try to cover that with something or superimpose it with something, (a) we're going to see that it's a superimposition and (b) it's going to be less interesting, because you're going to have less of your complexity around.

That's why I try taking a breath and letting it out and reading a line. And if I don't like what I find, I take another breath and I let it out and I find another feeling. Because that's an infinite well down there. That's never going to dry up on me, ever ever ever. The only thing you don't ever want to do is give up the gifts of your imagination, and the way that you give up the gifts of your imagination and the way that we all invalidate them is, we censor them. You get an impulse to laugh during a marriage proposal, and you censor it. You feel it's inappropriate. Where in fact if you laughed it might open up some well. You might burst into tears the next moment.

Remember, tape is cheap; you can always redo it if they don't like it. I try to train myself never to refuse a gift of the imagination. Sometimes it makes me inappropriate, sometimes it embarrasses me, but my livelihood and my sense of being in the front of the train, looking forward, as opposed to in the caboose looking backwards, depends on honoring those impulses. And I would suggest that whoever you are is what you bring on that *day*. If you have a bellyache, the bellyache will read. If in that moment you're sort of lassitudinous and start there, you'll never be able to stay there through the whole reading, but if you honor that, maybe by the end of the first take you'll have come to a completely different place and you'll be completely synchronous and integrated with it. And I think that you will

not feel judgmental about yourself, you will not feel self-conscious, you'll just feel present and absorbed the same way you do when you get interested in virtual reality or are sharpening your knife.

Brand: I'd love to do that, to get real on the radio. I wonder how much one can read with long pauses on the radio.

Coyote: As much as you want. If the pause is full. If you're thinking, we know it.

Brand: But that would be artificial naturalness, in a way, because a lot of the pauses in real talk are thinking what to say next. But I've got a script. I've already thought what to say next. I can sort of reproduce that process, maybe?

Coyote: You can't do that. The only place that you should pause is if, as you're reading a line, something occurs to you. Think about it. Because it probably occurred to the audience. And if you meander too far, go back. Or say what you thought of. Never fake it. If you find something wonderful on a first take, don't try to repeat it on the second take. Just trust that if you go back in there new, something else will come. Something will always come. The trick is to stay on the front of the train. That's where the jazz is. You don't have to be a salesman. If you turn on the radio, every once in a while you'll hear some guy say, "You know... I woke up this morning... and I walked to my refrigerator... I opened it up... I poured a glass of orange juice that you... couldn't... believe."

I have you, right? Because I'm seeing it. And if you see the images and you leave time, you're giving the audience time. Let them remember. You say, "The doors don't work..." How won't they work?

Brand: My favorite is: at the front of the restaurant there's two doors. One opens. The other doesn't. And they don't tell you which one.

Coyote: See, now that's great. That's a perfect sentence. That's the way you talk. When you've got five minutes, two minutes of that could be pauses. If they're good pauses, nobody's going to care. They're going to appreciate the contrast with the usual freneticism on the radio.

Say it simply, say it conversationally, and say it graphically. And if you want to listen, start listening to rap music; it's the most interesting music on the radio. It's the street newspaper. It's what black people are using to communicate with each other, through MTV. Or turn on a Sunday morning black church service, and listen to how oral speakers organize: "Ah woke up this mornin'!" "Mm-hmm." "I'm sayin' ah woke up! Got mahself outta the bed." "Mm-hmm!" I mean, it's chunks. Jesse Jackson speaks for an oral audience—puns, little things that delight the ear. Your essay delights the mind and the eye, but it's not written for speech.

Try it for speech: "Last week I heard from a man in Minneapolis... His building's in an uproar because they're trying to install some cabling to link all the personal computers together... That sounds like a pretty easy job. Just drill some holes in the floor, run the wires through and connect 'em... The problem is, nobody knows where the wires that are already there, are..." You say that and let it sit for a second. Imagine that. Nobody knows where the wires are. Some genius built this building. He's got blueprints, he's got plans. They probably paid hundreds of thousands of dollars for the plans. And nobody knows where the wires are. "So what do you think they're doing?... They're x-raying the building."

You're painting a movie for them. And whatever you're actually feeling about that, feel. And if you're not feeling anything about it, if your way is to be like a Maine storyteller, that's fine too. Absence of feeling would be funny, if the images are graphic. So, I would listen to spoken-word records. Just to start to hear how the ear is addressed differently than the eye and the mind.

Brand: I may have been polluted. I listen to books on tape a lot. Right now I'm listening to *I, Claudius*, and of course I'm listening to written prose.

Coyote: That's right. I think I would listen to theater on tape.

Brand: I did listen to some Winston Churchill speeches. Churchill is amazing. He wrote these long sentences, and he spoke them slow, with his rolling

delivery. Each sentence would have meaning that would take three turns, or four, to come to the conclusion, and you're with him the whole way. God-damnedest thing I ever heard.

Coyote: Think of the confidence he had to just assume that you're going with him. There's a wonderful term in acting; it's called "leaking." Leaking is when an actor lets a feeling slip that he's not controlling. For instance, when you see somebody who's on stage and you know they're really frightened, that's leaking. And the reason it's a disaster is because it shakes your confidence. You don't want to watch *real* panic, you don't want to watch a real person be humiliated, so you don't want to be engaged. You'll watch anything if there's no leak.

So, the way to confidence is, you have to psych yourself that you're already interesting and that the audience is going to come with you, and if they don't, that's *their* problem. But you can't run after them. Because it's only your mastery and your confidence that will give them the confidence to trust you.

Brand: That's interesting. Speaking to a live audience I have no problem. But what you're talking about happened to me on the Dick Cavett Show. There was a studio audience, but they were nothing, behind a huge cloud of machinery. I was thinking of the cosmic television audience — *with my mother in it!* And her friends! I froze. I stumbled through it, but I froze on Dick Cavett.

Coyote: Well, let me give you an exercise I gave to the poet Michael McClure once, which ended his self-consciousness, his stage fright. You go back to some situation like Dick Cavett. You pick the person in the audience, the mental image that's cowering you. That's step one. Step two is to ascertain the age of that person. Let's say, if it's your mother, how old is she?

Brand: Then, she was 65.

Coyote: No no no. How old was she in your image?

Brand: That's interesting. Fifty-something.

Coyote: Okay. Then what you have to do is, you have to look at how old you



SF Diggers, 1969; '38/'70 H-D.

were when she was that age. In Michael's case it was easy, because his mother was about 35, and all of a sudden he realized that he was about eight or ten. Then what you have to do is you have to fast forward that person up till they're their contemporary age, and then you have to see, does that power dynamic still work? Do you still feel cowed if you're facing that person? Then if you do, there are a whole host of ways to manipulate your mental image of the event. One way is to make them very, very tiny and put them in black and white in the corner of a color picture.

I prefer to put myself on stage and I put that person in the audience, and I run myself through the event mentally and I try to contact that feeling. Now I back up, or go forward, and I change that person's seat. I put them way in the back of the room, I make them very small, really insignificant, and I run through the scene again, and then that particular valence is just gone.

One thing to do is to get in touch with your mental pets and find out who you've groomed in there that you're giving the power to make you insecure — what audience you're performing for psychically. A guy who is always being observed by a critical father is going to walk into a room very differently than a guy who is being observed by his adoring mother, or his loving baby sister, or whoever it is. You have to find who's inhabiting your psyche in there, and disenfranchise them.

Brand: Are there *good* audiences to imagine or to pick out?

Coyote: Yeah. You pick a someone that makes you feel powerful and confident and comfortable. The best one I've found is Lucky. Because I think that we perceive our own personal power as a feeling of luck, and when I feel lucky I'm at my most powerful. And then, yes, you construct them as an audience, and you invoke them before you read, or you ask them mentally to come to the taping, and you talk to them.

Brand: There's a downside to pregnant pauses. It can be horrible when you pause a long pause, like there's a great word coming, and it's not a great word.

Coyote: A friend of mine who is an acting coach said something brilliant once. He said, you know, it's the *second* moment that makes you a dishonest person. In conversation we all reach for something sometimes and miss, or we go over the top, or our enthusiasm is childish and stupid. It happens to all of us. If you try to cover it up, *that's* what makes you a dishonest person. If you somehow acknowledge that you did that — a shrug or a gesture or a self-deprecating smile, whatever it is — you have our confidence. Because we've all seen it. We've all seen you go over the top, and now we either see you try to cover it and take control back again, or we see you cop to it, and we trust you. That's a formidable observation, because it means that you can be totally fearless. 🐾

Cypherpunks, and the

This one is a world-changer. Personal encryption may be as revolutionary as personal computers in transforming the web of human communication. Certainly the grassroots inventors and casual distributors of encryption technology have the same revolutionary zeal as the hackers who created personal computing, and the same decentralizing goal: power to the people.

*Kevin Kelly has been scouting the frontiers of emergent behavior and ideas around complexity theory and electronic net practice for several years. His book of findings will be published in 1994 by Addison-Wesley, with the title *Out of Control* (derived from roboticist Rodney Brooks's mantra, "Fast, cheap, and out of control.") This article is a chapter.*

Since I am allied with cypherpunks and their program, I feel cheerfully duty-bound to raise a question or two, such as: "If the real world is awkward to work with and full of cops, and if electronic cyberspace is easy to work with and has no effective cops (thanks to universal encryption) AND is where all the money is, what does that suggest about the future of crime?" —SB

IN TIM MAY'S EYES

a digital tape is a weapon as potent and subversive as a shoulder-mounted Stinger missile.

May (fortyish, trim beard, ex-physicist) holds up a \$9.95 digital audio tape, or DAT. The cassette — just slightly fatter than an ordinary cassette — contains a copy of a Mozart composition equivalent in fidelity to a conventional digital compact disc. DAT can hold text as easily as music. If the data is smartly compressed, one DAT purchased at K-Mart can hold about 10,000 books in digital form.

One DAT can also completely cloak a smaller library of information interleaved within the music. Not only can the data of about 600 books (80 megabytes) be securely encrypted within a digital tape, but the library's existence on the tape would be invisible even to powerful computers. In the scheme May (and others) promote, a computer hard disk's worth of coded information could be made to disappear inside an ordinary digital tape of Michael Jackson's "Thriller."

The vanishing act works as follows. DAT records music in sixteen binary digits, but that precision is beyond perception. The difference contained in the sixteenth bit of the signal is too small to be detectable by the human

ear. A long message — a book of diagrams, a pile of data spreadsheets — can be substituted (in encrypted form) in the positions of all the sixteenth bits of music. Anyone playing the tape would hear Michael Jackson crooning in the exact digital quality they would hear on a purchased "Thriller" tape. Anyone examining the tape with a computer would see only digital music. Only by matching an untampered-with tape with the encrypted one bit by bit on a computer could someone detect the difference. Even then, the random-looking differences would appear to be noise acquired while duping a digital tape through an analog CD player (as is normally done). Finally, this "noise" would have to be decrypted (not likely) to prove that it was something other than noise.

"What this means," says May, "is that already it is totally hopeless to stop the flow of bits across borders. Because anyone carrying a single music cassette bought in a store could carry the entire computerized files of the Stealth bomber, and it would be completely and totally imperceptible." One tape contains disco music. The other tape contains disco and the essential blueprints of a key technology.

E-Money,

Technologies of Disconnection

Music isn't the only way to hide things, either. "I've done this with photos," says May. "I take a digitized photo posted on the net, download it into Adobe Photoshop, and then strip an encrypted message into the least significant bit in each pixel. When I repost the image, it is essentially indistinguishable from the original."

The other thing May is into is wholly anonymous transactions. If one takes the encryption methods developed by military agencies and transplants them into the vast terrain of electronic networks, very powerful — and very unbreakable — technologies of anonymous dealing become possible. Two complete strangers could solicit or supply information to each other, and consummate the exchange with money, without the least chance of being traced. That's something that cannot securely be done with phones and the post office now.

It's not just spies and organized crime who are paying attention to this technology. Efficient means of authentication and verification, such as smart cards, tamperproof networks, and micro-size encryption chips, are driving the cost of ciphers down to the consumer level.

Encryption is now affordable for everyman.

The upshot of all this, Tim believes, is the end of corporations in their current form and the beginning of more sophisticated untaxed black markets. Tim calls this movement Crypto-Anarchy. "I have to tell you I think there is a coming war between two forces," Tim May confides to me. "One force wants full disclosure, an end to secret dealings. That's the government going after pot smokers and controversial bulletin boards. The other force wants privacy and civil liberties. In this war, encryption wins. Unless the government is successful in banning encryption, which it won't be, encryption always wins."

A couple of years ago, May wrote a manifesto to alert the world to the advent of widespread encryption. In this electronic broadside, published on the net, he warned of the coming "specter of crypto anarchy":

The State will of course try to slow or halt the spread of this technology, citing national security concerns, use of the technology by drug dealers and tax evaders, and fears of societal disintegration. Many of these concerns will be valid; crypto anarchy will allow national secrets to be traded freely and will allow illicit and stolen ma-

BY KEVIN KELLY

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materials to be traded. An anonymous computerized market will even make possible abhorrent markets for assassinations and extortion. Various criminal and foreign elements will be active users of CryptoNet. But this will not halt the spread of crypto anarchy.

Just as the technology of printing altered and reduced the power of medieval guilds and the social power structure, so too will cryptologic methods fundamentally alter the nature of corporations and of government interference in economic transactions. Combined with emerging information markets, crypto anarchy will create a liquid market for any and all material which can be put into words and pictures. And just as a seemingly minor invention like barbed wire made possible the fencing-off of vast ranches and farms, thus altering forever the concepts of land and property rights in the frontier West, so too will the seemingly minor discovery out of an arcane branch of mathematics

come to be the wire clippers which dismantle the barbed wire around intellectual property.

The manifesto was signed:

Timothy C. May, Crypto Anarchy: encryption, digital money, anonymous networks, digital pseudonyms, zero knowledge, reputations, information markets, black markets, collapse of government.

I asked May, a retired Intel physicist, to explain the connection between encryption and the collapse of society as we know it. May explained: "Medieval guilds would monopolize information. When someone tried to make leather or silver outside the guilds, the King's men came in and pounded on them because the guild paid a levy to the King. What broke the medieval guilds was printing; someone could publish a treatise on how to tan leather. In the age of printing, corporations arose to monopolize certain expertise, like gunsmithing or making steel. Now encryption will cause the erosion of the current corporate monopoly on expertise and proprietary knowledge. Corporations won't be able to keep

secrets because of how easy it will be to sell information on the nets."

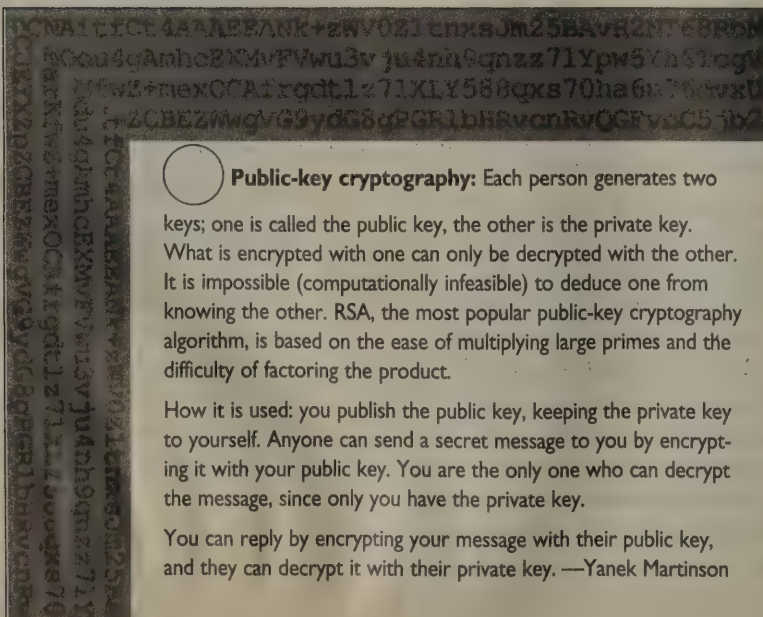
The reason crypto-anarchy hasn't broken out yet, according to May, is that the military has a monopoly on the key knowledge of encryption — just as the Church once tried to control printing. With few exceptions, encryption technology has been invented by and for the world's military organizations. To say that the military is secretive about this technology would be an understatement. Very little developed by the US National Security Agency (NSA) — whose mandate it is to develop crypto-systems — has ever trickled down for civilian use, unlike technologies spun off from the rest of the military/industrial alliance.

But who needs encryption, anyway? Only people with something to hide, perhaps. Spies, criminals, and malcontents. People whose appetite for encryption may be thwarted righteously, effectively, and harshly.

The ground shifted two decades ago, when the information age arrived and intelligence became the chief asset of corporations. Intelligence was no longer the monopoly of the Central Intelligence Agency, but the subject of seminars for CEOs. Spying meant corporate spying. Illicit transfer of corporate knowhow, rather than military plans, became the treasonous information the state had to worry about.

In addition, within the last decade, computers became fast and cheap; enciphering no longer demanded supercomputers and the super-budg-gets needed to run them. A generic-brand PC picked up at a garage sale could handle the massive computations a public-key encryption scheme required. For small companies running their entire business on PCs, encryption was a tool they wanted on their hard disks.

And now, within the last few years, a thousand electronic networks have



Public-key cryptography: Each person generates two keys; one is called the public key, the other is the private key. What is encrypted with one can only be decrypted with the other. It is impossible (computationally infeasible) to deduce one from knowing the other. RSA, the most popular public-key cryptography algorithm, is based on the ease of multiplying large primes and the difficulty of factoring the product.

How it is used: you publish the public key, keeping the private key to yourself. Anyone can send a secret message to you by encrypting it with your public key. You are the only one who can decrypt the message, since only you have the private key.

You can reply by encrypting your message with their public key, and they can decrypt it with their private key. —Yanek Martinson

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Sender untraceability: A protocol by which one of a group of communicating entities can send a public message that is impossible to trace to the sender. This can send messages anonymously or pseudonymously and untraceably. One protocol that makes this possible is David Chaum's dc-net protocol, in which every participant sends some data; when all the data are combined, the anonymous message emerges. This has been called the "cryptographic ouija board," because a message appears, but it is impossible to find out who sent it. If one-time pads are used, this system is unconditionally secure — even an enemy with infinite time and processing power cannot deduce the sender from the available information.

Another sender untraceability system is the mix-net (or "remailer") approach. In this case, you send your message to a remailer, with encrypted instructions on where to send it. By sending your message through a chain of such remailers, untraceability is achieved. This depends on the remailers not keeping logs that can correlate incoming and outgoing messages, or on their unwillingness to reveal such logs to your enemy.

Receiver untraceability: A method to retrieve a message sent to you, without anyone having any way of knowing that you received the message — or, indeed, if you received any message.

How it works: Someone wanting to send you a message encrypts it with your public key and posts it on a bulletin board. You download all the messages from the bulletin board periodically, and see if you can decrypt any using your private key.

Since everyone downloads all the messages, then attempts to decrypt them on their own machine, no one observing the communications link has any way of knowing who received what message, or even if someone received any messages at all. This system, along with the dc-net, can provide completely untraceable global communications. It does, however, require substantial communications bandwidth and storage capacity.

None of these technologies can accomplish much by itself. But if they are put together, any person can send messages to any other person, or transact business, without anyone but the two of them knowing what occurred — or even that anything occurred between the two.

Furthermore, the two people don't need to know anything about each other but their public keys. They can be completely anonymous, or use pseudonyms. —YM

blossomed into one highly decentralized network of networks. A network is a distributed thing; if one part breaks, the workload is routed around that failing, and the whole net keeps flying. There are few centers of control, and few clear boundaries. How do you secure something that doesn't even know how big it is? Certain types of encryption, it turns out, are an ideal way to bring security to a decentralized system while keeping the system flexible. Rather than trying to seal out trouble with a rigid wall of security, networks can tolerate all kinds of crap if a large portion of their members use peer-to-peer encryption.

Suddenly, encryption has become incredibly useful to ordinary people who have "nothing to hide" but their privacy. Peer-to-peer encryption,

sown into the net, linked with electronic payments, tied into everyday business deals, becomes just another business tool, like fax machines or credit cards.



Just as suddenly, taxpaying citizens — whose dollars funded the military ownership of this technology — want the technology back.

But the government (at least the US government) may not give encryption back to the people for a number of antiquated reasons. So, for the past

year or so, a loose federation of creative math hackers, civil libertarians, free-market advocates, genius programmers, renegade cryptologists, and sundry other frontier folk, has been creating, assembling, or appropriating encryption technology to plug into the net. Some of them call themselves cypherpunks.

On a couple of Saturdays, I join Tim May and about fifteen other cryptorebels for their monthly cypherpunk meeting, held near Palo Alto, CA. The group meets in a typically nondescript office complex full of small

hi-tech startup companies. It could be anywhere in Silicon Valley. The room has corporate-gray carpeting and a conference table. The moderator for



this meeting, Eric Hughes,  tries to quiet the cacophony of loud, opinionated voices. Hughes, with sandy hair halfway down his back, grabs a marker and scribbles the agenda on a whiteboard. The items he writes down echo Tim May's digital card: reputations, PGP encryption, anonymous remailer update, and the Diffie-Hellman key exchange  paper.

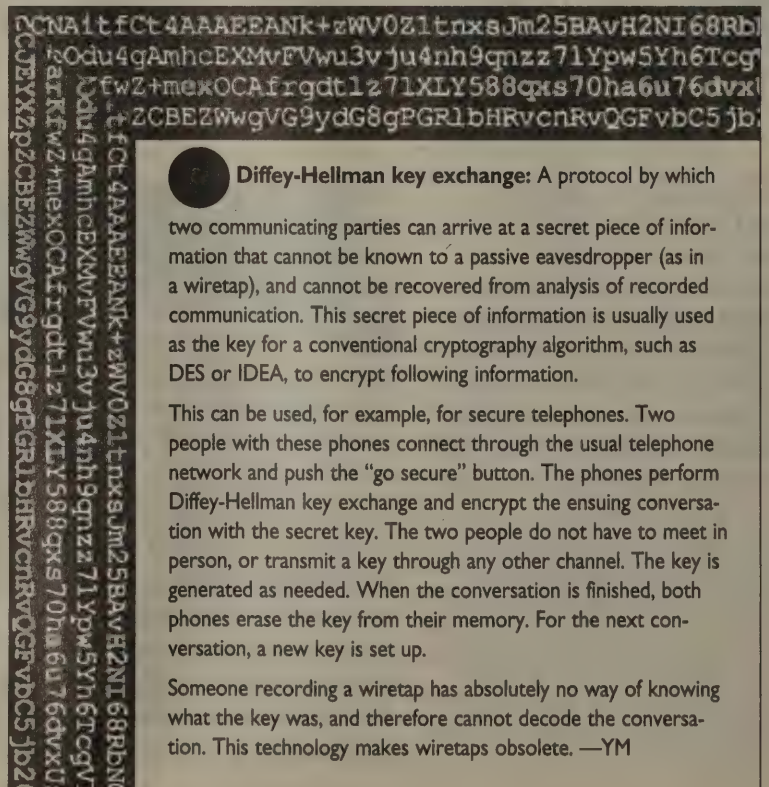
After a bit of gossip the group gets down to business. It's class time. One member, Dean Tribble, stands up front to report on his research on digital reputations. If you are trying to do business with people you know only as names introducing some email, how can you be sure they are legit? Tribble suggests that you can buy a reputation from a "trust escrow" — a company similar to a title or bond company that would guarantee someone for a fee. He explains the lesson from game theory concerning iterated negotiation games, like the Prisoner's Dilemma; how payoffs shift when playing the game over and over instead of just once, and how important reputations become in iterated relationships. The potential problems of buying and selling reputations online are chewed on, and suggestions of new directions for research are made, before Tribble sits down and another member stands to give a brief talk. Around the table it goes.

Arthur Abraham, dressed in heavy, studded black leather, reviews a recent technical paper on encryption. Abraham flicks an overhead projector on, whips out some transparencies painted with equations, and walks the group through the mathematical proof. It is clear that the math is not easy for most. Sitting around the table are programmers (many self-taught), engineers, consultants — all very smart — but only a single mem-

ber is equipped with a background in mathematics. "What do you mean by that?" questions one quiet fellow as Abraham talks. "Oh, I see, you forgot the modulus," chimes in another guy. "Is that a to the x or a to the y ?" The amateur crypto-hackers challenge each statement, asking for clarification, mulling it over until each understands. The hacker mind, the programmer's drive to whittle things down to an elegant minimum, to seek shortcuts, confronts the academic stance of the paper. Pointing to a large hunk of one equation, Dean Tribble asks, "Why not just scrap all this?" A voice from the back: "That's a great question, and I think I know why not." So the voice explains. Dean nods. Arthur looks around to be sure everyone got it. Then he goes on to the next line in the paper; those who understand help out those who don't. Soon the room is full of people saying, Oh, that means you can serve this up on a network configuration! Hey, cool! And another tool for distributed computing is born; another component is transferred from

shroud of military secrecy to the open web of the net; another brick is set into the foundation of public encryption.

The main thrust of the group's efforts takes place in the virtual online space of the Cypherpunk electronic mailing list. A growing crowd of crypto-hip folks from around the world interact daily via an Internet "mailing list." Here they pass around code-in-progress as they attempt to implement ideas on the cheap (such as digital signatures ) or discuss the ethical and political implications of what they are doing. An anonymous subset of them has launched the Information Liberation Front.  The ILF locates scholarly papers on cryptology appearing in very expensive (and very hard-to-find) journals, scans them in by computer, and "liberates" them from their copyright restrictions by posting the articles anonymously to the net.

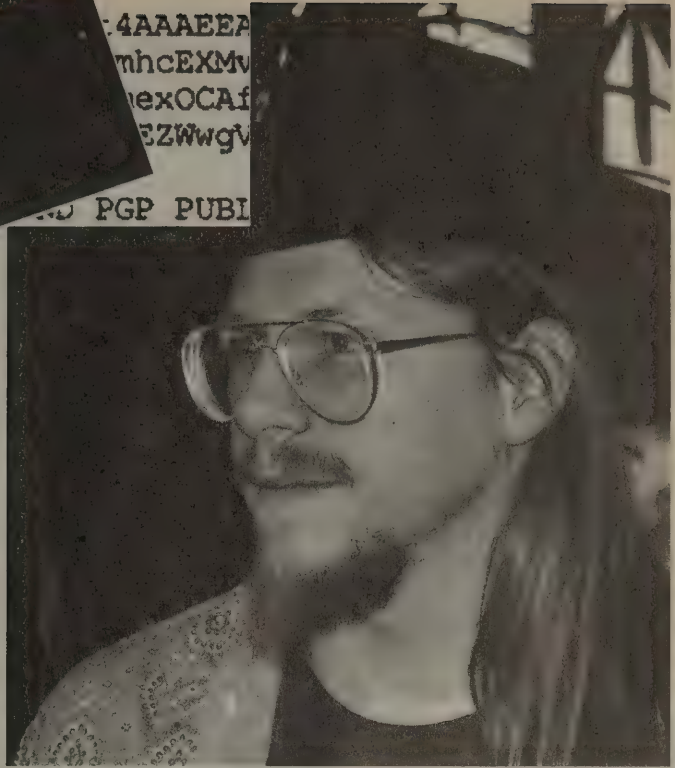
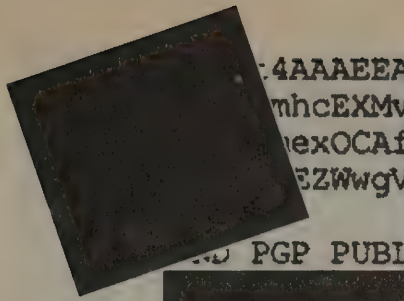


Diffie-Hellman key exchange: A protocol by which two communicating parties can arrive at a secret piece of information that cannot be known to a passive eavesdropper (as in a wiretap), and cannot be recovered from analysis of recorded communication. This secret piece of information is usually used as the key for a conventional cryptography algorithm, such as DES or IDEA, to encrypt following information.

This can be used, for example, for secure telephones. Two people with these phones connect through the usual telephone network and push the "go secure" button. The phones perform Diffie-Hellman key exchange and encrypt the ensuing conversation with the secret key. The two people do not have to meet in person, or transmit a key through any other channel. The key is generated as needed. When the conversation is finished, both phones erase the key from their memory. For the next conversation, a new key is set up.

Someone recording a wiretap has absolutely no way of knowing what the key was, and therefore cannot decode the conversation. This technology makes wiretaps obsolete. —YM

□ The Information Liberation Front locates scholarly papers on cryptology appearing in very expensive (and very hard-to-find) journals, scans them in by computer, and “liberates” them from their copyright restrictions by posting the articles anonymously to the net.



Kevin Kelly

Posting anything anonymously to the net is quite hard: the nature of the net is to track everything infallibly, and to duplicate items promiscuously. It is theoretically trivial to monitor transmission nodes in order to back-track a message to its source. In such a climate of potential omniscience, the crypto-rebels yearn for true anonymity.

I confess my misgivings about the potential market for anonymity to Tim: “Seems like the perfect thing for ransom notes, extortion threats, bribes, blackmail, insider trading and terrorism.” “Well,” Tim answers, “what about selling information that

isn’t viewed as legal, say about pot-growing, do-it-yourself abortion, cryonics, or even peddling alternative medical information without a license? What about the anonymity wanted for whistleblowers, confessionals, and dating personals?”

Digital anonymity is needed, the crypto-rebels feel, because anonymity is as important a civil tool as authentic identification is. Pretty good anonymity is offered by the post office; you don’t need to give a return address, and the post office doesn’t verify it if you do. Telephones (without caller ID) and telegrams are likewise anonymous (to a rough degree). And everyone has a right (upheld by the Supreme Court) to distribute anonymous handbills and pamphlets. Anonymity stirs the most fervor among those who spend hours each day in networked communications. Ted Kaehler, a programmer at Apple Computer, believes that “our society is in the midst of a privacy crisis.” He sees encryption as an extension of such all-American institutions as the post office. “We have always valued the privacy of the mails. Now, for the first time, we don’t have to trust in it; we can enforce it.” John Gilmore, a

○ **Digital signatures:** Techniques used to verify that a message claiming to be from you was actually written by you. To do that, you compute a “message digest,” which is similar to a checksum in that it can be used to check that the message has not been altered. Then you encrypt the digest with your private key and attach it to the message.

To verify a signature, the person verifying computes the same checksum, then decrypts the checksum attached to the message. If the two match, the message must have been signed by you: without your private key, no one else could have generated the signature. —YM

crypto-freak who sits on the board of the Electronic Frontier Foundation, says, "We clearly have a societal need for anonymity in our basic communications media."

A pretty good society needs more than just anonymity. An online civilization requires online anonymity, online identification, online authentication, online reputations, online trustholders, online signatures, online privacy, and online access. All are essential ingredients of any open society. The cypherpunks' agenda is to build the tools that provide digital equivalents to the interpersonal conventions we have in face-to-face society, and hand them out for free. By the time they are done, the cypherpunks hope to have given away free digital signatures, as well as the opportunity for online anonymity.¹

To create digital anonymity, the cypherpunks have developed about fifteen prototype versions of an anonymous remailer that would, when fully implemented, make it impossible to determine the source of an email message, even under intensive monitoring of communication lines. One stage of the remailer works today. When you use it to mail Alice, she gets a message from you that says it is from "nobody." Unraveling where it came from is trivial for any computer capable of monitoring the entire network — a feat few can afford. But to be mathematically untraceable, the remailers have to work in a relay of at least two (more is better) — one remailer handing off a message to the next remailer, diluting information about its source to nothing as it is passed along.

Eric Hughes sees a role for digital pseudonymity — your identity is known by some but not by others. When cloaked pseudonymously,

1 A fuller account of the cypherpunk agenda, and cypherpunks' uneasy relations with the cryptography establishment can be found in Steven Levy's informative cover story, "Crypto Rebels," in the May/June 1993 issue of *Wired* (reviewed on p. 54).

"You could join a collective to purchase some information and decrease your actual cost by orders of magnitude — that is, until it is almost free." A digital co-op could form a private online library and collectively purchase digital movies, albums, software, and expensive newsletters, which they would "lend" to each other over the net. The vendor selling the information would have absolutely no way of determining whether he was selling to one person or five hundred. Hughes sees these kinds of arrangements peppered into an information-rich society as "increasing the margins where the poor can survive." "One thing for sure," Tim says, "long term, this stuff nukes tax collection." I venture the rather lame observation that this may be one reason the government isn't handing the technology back. I also offer the speculation that an escalating arms race with a digital IRS might evolve. For every new avenue the digital underground invents to disguise transactions, the digital IRS will counter with a surveillance method. Tim pooh-poohs the notion.

An online civilization requires online anonymity, online identification, online authentication, online reputations, online trustholders, online signatures, online privacy, and online access. The cypherpunks' agenda is to build the tools that provide digital equivalents to the interpersonal conventions we have in face-to-face society, and hand them out for free.

"Without a doubt, this stuff is unbreakable. Encryption *always* wins."

The Fax Effect

Encryption always wins because it follows the logic of the net. A given public-key encryption key can eventually be cracked by a supercomputer working on the problem long enough. Those who have codes they don't want cracked try to stay ahead of the supercomputers by increasing the length of their keys (the longer a key is the harder it is to crack) — but at the cost of making the safeguard more unwieldy and slow to use. However, *any* code can be deciphered, given enough time or money. As Eric Hughes often reminds fellow cypherpunks, "Encryption is economics. Encryption is always possible, just expensive." It took A. Shamir a year to break a 120-digit key using a network of distributed Sun workstations working part-time. A person could use a key so long that no supercomputer could crack it for the foreseeable future, but it would be awkward to use in daily life. A buildingful of NSA's specially hot-rodded supercomputers might take a day to crack a 140-digit code today. But that is a full day's commitment of big iron to open just one lousy key!

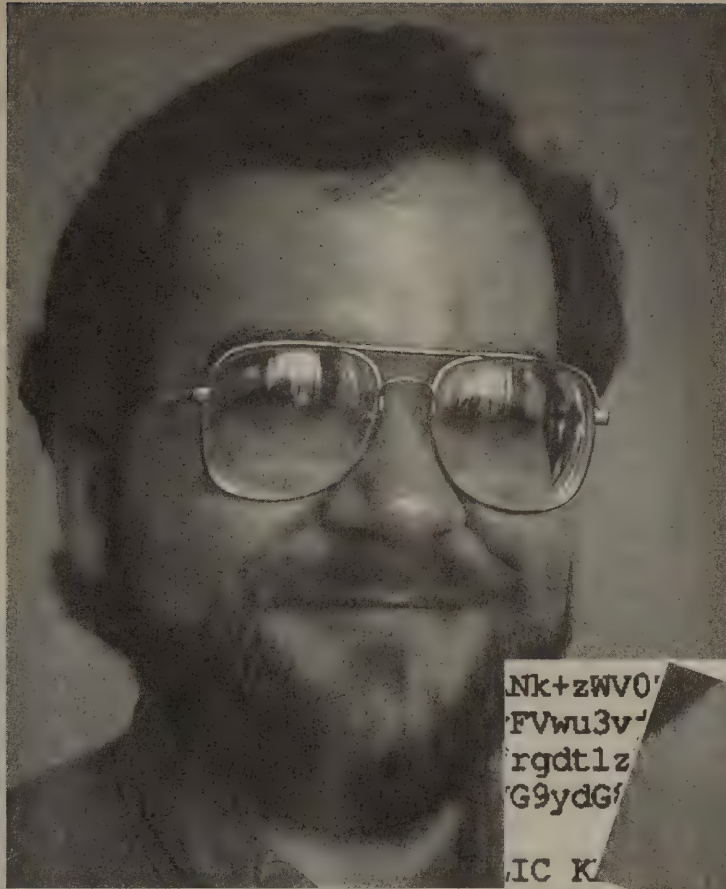
Cypherpunks intend to level the playing field against centralized computer resources with the Fax Effect. If you have the only fax machine in the world, it is worth nothing. But with every other fax installed in the world, your fax machine increases in value. In fact, the more faxes in the world, the more valuable everybody's fax becomes. This is the logic of the net, also known as the law of increasing returns. It goes contrary to classical economic theories of wealth based on equilibratory tradeoff. These state that you can't get something from nothing; the truth is, you can. (Only now are a few radical professors formalizing this notion.) Hackers, cypherpunks, and many hi-tech

entrepreneurs already know that in network economics, more brings more. This is why giving things away so often works, and why the cypher-punks want to pass out their tools gratis. It has less to do with charity than with the clear intuition that network economics reward the more and not the less — and you can seed the “more” at the start by giving the tools away. (The cypherpunks also talk about using the economics of the net for the reverse side of encryption: to crack codes. They could assemble a people’s supercomputer by networking together a million Macintoshes, each one computing a coordinated little part of a huge, distributed decryption program. In theory such a decentralized parallel computer would, in sum, be the most powerful computer we can now imagine — far greater than the centralized NSA’s.)

Encryption taps the Fax Effect. If you are the only person using encryption, you are a lightning rod for an attempted cracking. But your keys become more valuable as more people use encryption, because this lessens the possibility of your key being cracked. Just as with fax, the more people using encryption, the more valuable it becomes for all. The world’s most powerful super-computer grinds all day to crack one key. What is it going to do when 100 million people each use 100 different keys per day?

The idea of choking Big Brother with a deluge of petty, heavily encrypted messages so tickles the imagination of crypto-rebels that one of them came up with a freeware version of a highly regarded public-key encryption scheme. The software is called PGP, for Pretty Good Privacy. The code has been passed out on the nets for free and made available on disk. In certain parts of the net it is quite common to see messages encrypted with PGP, with a note that the sender’s public key is “available upon request.”

PGP is not the only encryption



freeware. On the nets, cypherpunks can grab RIPEM, a software application for privacy-enhanced mail. Both PGP and RIPEM are based on RSA, a patented implementation of encryption algorithms. But while RIPEM is distributed as public-domain software by RSA (the company), Pretty Good Privacy software is homebrew code concocted by a crypto-rebel named ▲ Philip Zimmermann. Because Pretty Good Privacy uses RSA’s patented math, it’s outlaw-ware.

RSA was developed at MIT — partly with federal funds — but was later licensed to the academic researchers who invented it. The researchers published their crypto-methods before they filed for patents, out of fear that the NSA would hold up the patents or even prevent the civilian use of

their system. In the US, inventors have a year after publication to file patents. But the rest of the world requires patents before publication, so RSA could secure only US patents on its system. PGP’s use of RSA’s patented mathematics is legitimate overseas. But PGP is commonly exchanged in the no-place of the net (what country’s jurisdiction prevails in cyberspace?), where the law on intellectual property is still a bit murky, and close to the beginnings of crypto-anarchy. Pretty Good Privacy deals with this legal tarbaby by notifying its American users that it is their responsibility to secure from RSA a license for use of PGP’s underlying algorithm. (Sure. Right.)

Zimmermann claims he released the quasilegal PGP into the world

because he was concerned that the government would reclaim all public-key encryption technology, including RSA's. RSA can't stop distribution of existing versions of PGP because once something goes onto the net, it never comes back. But it's hard for RSA to argue damages: both the outlaw PGP and the officially sanctioned RIPEM infect the net to produce the Fax Effect. PGP encourages consumer use of encryption — the more use, the better for everyone in the business. Pretty Good Privacy is freeware; like most freeware, its users will sooner or later graduate to commercially supported stuff. Only RSA offers the license for that at the moment. Economically, what could be better for a patentholder than to have a million people use the buddy system to teach themselves about the intricacies and virtues of your product (as pirated and distributed by others), and then wait in line to buy your stuff when they want the best?

The Fax Effect, the rule of freeware upgrade, and the power of distributed intelligence are all part of an emerging network economics. Tim May even sees the rise of encryption and the downfall of corporations as part of this new economics. ("Big monolithic corporations will become virtual corporations," he says, "a temporary ensemble of skilled people. They'll nucleate for six months to make a product, say a Hollywood film, and then the virtual corporation will dissipate and vanish.") Corporations will become shifting network ghosts in a networked world.

Politics in a network economy will definitely require the kind of tools the cypherpunks are playing with. Glenn Tenney, chairman of the annual Hackers' Conference, ran for public office in California last year using the computer networks for campaigning, and came away with a realistic grasp of how they will shape politics. He notes that digital techniques for establishing trust are needed for electronic democracy. He writes online, "Imagine if a Sen-

Encryption cultivates a "web of trust" — the very web that is the heart of any society or human network. The short form of the cypherpunk's obsession with encryption can be summarized as: Pretty good privacy means pretty good society. Networks shift privacy from the realm of morals to the marketplace; privacy becomes a commodity.

ator responds to some email, but someone alters the response and then sends it on to the *NY Times*? Authentication, digital signatures, etc. are essential for protection of all sides." Encryption and digital signatures are techniques to expand the dynamics of trust into a new territory. Encryption cultivates a "web of trust" says Phil Zimmermann, the very web that is the heart of any society or human network. The short form of the cypherpunk's obsession with encryption can be summarized as: Pretty good privacy means pretty good society.

One of the consequences of network economics, as facilitated by ciphers and digital technology, is the transformation of what we mean by pretty good privacy. Networks shift privacy from the realm of morals to the marketplace; privacy becomes a commodity.

A telephone directory has value

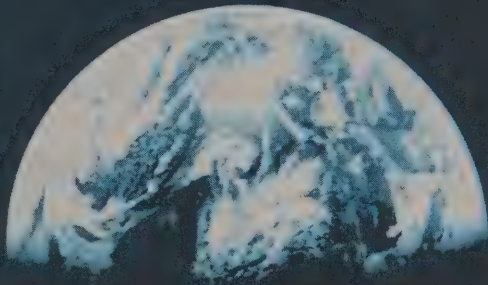
because of the energy it saves a caller in finding a particular phone number. When telephones were new, having an individual number to list in a directory was valuable to the lister and to all other telephone users (the Fax Effect). But today, in a world full of easily obtained telephone numbers, an unlisted phone number is more valuable to the unlisted (who pay more) and to the phone company (which charges more). Privacy is a commodity to be priced and sold.

Most privacy transactions will soon take place in the marketplace, rather than in government offices, because a centralized government is handicapped in a distributed, open-weave network, and can no longer guarantee how things are connected or not connected. Hundreds of privacy vendors will sell bits of privacy at market rates. You hire Little Brother, Inc. to demand maximum payment from junk-mail and direct marketers when you sell your name, and to monitor uses of that information as it tends to escape into the net. On your behalf, Little Brother, Inc. negotiates with other privacy vendors for hired services such as personal encrypters, absolutely unlisted numbers, bozo filters, stranger-ID screeners (such as caller ID on phones that only accept calls from certain numbers), and for hired mechanical agents (called network "knowbots") to trace addresses, and for counter-knowbots that unravel traces of your own activities.

Privacy is a type of information that has its polarity reversed; I imagine it as anti-information. The removal of a bit of information from a system can be seen as the reproduction of a corresponding bit of anti-information. In a world flooded with information ceaselessly replicating itself to the edges of the net, the absence or vaporization of a bit of information becomes very valuable, especially if that absence can be maintained. In a world where everything is connected to everything — where connection and information

mil•len•ni•um *n.*,

1. A period of 1,000 years.
2. A hoped-for period of joy, prosperity, and peace.
3. *Informal.* Time for a new *Whole Earth Catalog.*



The Millennium Whole Earth Catalog

Over the past twenty-five years, Whole Earth's readers, writers, and editors have grown into an extraordinary world-wide community of information hunters, gatherers and sorters. It's time to mobilize that network to help us navigate the last, crucial years of the 20th century.

There is no alternative but for everyone to make the whole world work. We're moving into the next millennium. How are we going to cope as individuals, families, communities? Let's find the very best new tools and learn how to use them.

For a quarter-century, the Whole Earth Catalogs have been helping people take the levers in their own hands. It's time to do it again, on a scale beyond anything we've attempted before. That's where you come in. You know something about what the world will need in the remaining 1990s. Help us tell everybody else on the planet about it.

We want to know how to heal and protect the natural environment. We also want to know about urban survival. Tell us how to heat a house, grow a crop, restore a tenement. We want to know about educational tools and toys, new technologies, ways to cope in corporations (and ways to change them), ways to grow businesses, and ways to take care of your home and neighborhood. We need you to tell us about political tools that work, responsible investments to make, indispensable books, magazines and zines, essential tools and services. What has worked for your family, your community, your bioregion?

This is a book for the whole world; we particularly need to hear from our readers outside the United States.

Here's a great chance to make a difference. Help us to do what needs to be done.

and knowledge are dirt cheap — then disconnection and anti-information and no-knowledge become expensive. When bandwidth becomes free and entire gigabytes of information are swapped around the clock, what you don't want to communicate becomes the most difficult chore. Encryption systems and their ilk are technologies of disconnection. They attempt to tame the network's innate tendency to connect and inform without discrimination.

The Next Utility Meter

We manage the disconnection of other domestic utilities, such as water or electricity, through metering. But metering is neither obvious nor easy. Thomas Edison's dazzling electrical gizmos were of little use to anyone until people had easy access to electricity in their factories and homes. So, at the peak of his career, Edison diverted his attention away from designing electrical devices to focus on the electrical delivery network itself. At first, very little was settled about how electricity should be created (DC or AC?), carried, or billed. For billing, Edison favored the approach that most information-providers today favor: charge a flat fee. Readers pay the same for a newspaper no matter how much of it they read. Ditto for cable TV, books and computer software. All are priced flat for all you can use.

Edison pushed a flat fee for electricity — a fixed amount if you are connected, nothing if you aren't — because he felt that the costs of accounting for differential usage would exceed the cost of the variances in electricity usage. But mostly Edison was stymied about how to meter electricity. For the first six months of his General Electric Lighting Company in New York City, customers paid a flat fee. To Edison's chagrin, that didn't work out economically. Edison was forced to come up with a stopgap solution. His remedy, an electrolytic meter, was erratic and impractical. It froze in winter, sometimes it ran backwards, and customers couldn't read it (nor did they trust

□ Privacy is a type of information that has its polarity reversed; I imagine it as anti-information. In a world where everything is connected to everything — where connection and information and knowledge are dirt cheap — then disconnection and anti-information and no-knowledge become expensive.

the meter readers). It wasn't until a decade after municipal electrical networks were up and running that another inventor came up with a reliable watt-hour meter. Now we can hardly imagine buying electricity any other way.

A hundred years later, the information industry still lacks an information meter. George Gilder, hi-tech gadfly, puts the problem this way: "Rather than having to pay for the whole reservoir every time you are thirsty, what you want is to only pay for a glass of water."

Indeed, why buy an ocean of information when all you want is a drink?

No reason at all, if you have an information meter. Entrepreneur Peter Sprague believes he has just invented one. "We use encryption to force the metering of information," says Sprague. His spigot is a microchip that doles out small bits of information from a huge pile of encrypted data. Instead of selling a CD-ROM crammed with a hundred thousand pages of legal documents for \$2,000, Sprague invented a ciphering device

that would dispense the documents off the CD-ROM at \$1 per page. A user only pays for what she uses, and can use only what she pays for.

Sprague's way of selling information per-page is to make each page unreadable until it is decrypted. Working from a catalog of contents, a user selects a range of information to browse. She reads the abstract or summaries (and is charged a minuscule amount). Then she selects a full text, which is decrypted by her dispenser. Each act of decryption rings up a small charge (maybe fifty cents). The charge is tallied by a metering chip in her dispenser that deducts the amount from a prepaid account (also stored on the metering chip), much as a postage meter deducts credit while dispensing postage tapes. When the CD-ROM credit runs out, she calls a central office, which replenishes her account via an encrypted message sent on a modem line running into her computer's metering chip. Her dispenser now has \$300 credit to spend on information — by the page, by the paragraph, or by the stock price, depending on how fine the vendor is cutting it.

What Sprague's encryption-metering device does is *decouple* information's fabulous ease in being copied from its owners' need to have it selectively disconnected. It lets information flow freely and ubiquitously — like water through a town's plumbing — by metering it out in usable chunks. Metering converts information into a utility.

The cypherpunks note, quite correctly, that this will not stop hackers from siphoning off free information. The Videocipher encryption system, used to meter satellite-delivered TV programs such as HBO and Showtime, was compromised within weeks of its introduction. Despite claims by its manufacturer that the crypto-metering chip was unhackable, big moneymaking scams capitalized on hacks around the codes. (The scams were set up on Indian reservations — but that's a whole

'nother story). Pirates would find a descrambler box with a valid subscription — in a hotel room, for instance — and then clone the identity into other chips. A consumer would send the box to the reservation for "repairs," and it would come back with a new chip cloned with the identity of the hotel box. The broadcasting system couldn't perceive clones in the audience. In short, the system was hacked not by cracking the code, but by subverting places where the code tied into the other parts of the system.

No system is hack-proof. But disruptions of an encrypted system require deliberate creative energy. Information meters can't stop thievery or hacking, but meters can counteract the effects of lazy mooching and the natural human desire to share. The Videocipher satellite-TV system eliminates user piracy *on a mass scale* — the type of piracy that plagued the TV outback before scrambling, and that still plagues the lands of software and photocopying. Encryption makes pirating a chore, and not something that any slouch with a blank disk can do. Satellite encryption works overall because encryption always wins.

Peter Sprague's crypto-meter permits Alice to make as many copies of the encrypted CD-ROMs as she likes, since she pays only for what she uses. Crypto-metering, in essence, disengages the process of payment from the process of duplication. This disconnection follows the bias of information.

Using encryption to force the metering of information works, because it does not constrain information's desire to reproduce. All things being equal, a bit of information will replicate through an available network until it fills that network. With an animate drive, every fact naturally proliferates as many times as possible. The more fit — the more interesting or useful — a fact is, the wider it spreads. A pretty metaphor compares the spread of genes through a

□ Each time your Mac
"plays" a piece of software,
it triggers a royalty.

population with the similar spread of ideas, or memes, in a population. Both genes and memes depend on a network of replicating machines — cells or brains or computer terminals. A network, in this general sense, is a swarm of flexibly interconnected nodes, each of which can copy (either exactly or with variation) a message taken from another node. A population of butterflies and a flurry of email messages have the same mandate: replicate or die. Information wants to be copied.

Our digital society has built a supernet of copiers out of hundreds of millions of personal faxes, library photocopiers, and desktop hard disks. It is as if our information society is one huge aggregate copy machine. But we won't let this super machine copy. Much to everyone's surprise, information created in one corner finds its way into all the other corners rather quickly. Because our previous economy was built upon scarcity of goods, we have so far fought the natural fecundity of information by trying to control every act of replication as it occurs. We take a massively parallel copy machine and try to stifle most acts of reproduction. As in other puritanical regimes, this doesn't work. Information wants to be copied.

"Free the bits!" shouts Tim May. This sense of the word "free" shifts Stewart Brand's oft-quoted maxim, "Information wants to be free" — as in "without cost" — to the more subtle "without chains or imprisonment." Information wants to be free to wander and reproduce. Success, in

a networked world of decentralized nodes, belongs to those plans that do not resist either the replication or roaming urges of information.

Sprague's encrypted meter capitalizes on the distinction between pay and copy. "It is easy to make software count how many times it has been invoked, but hard to make it count how many times it has been copied," says software architect Brad Cox. In a message broadcast on the Internet, Cox writes:

Software objects differ from tangible objects in being fundamentally unable to monitor their copying but trivially able to monitor their use. . . . So why not build an information age market economy around this difference between manufacturing age and information age goods? If revenue collection were based on monitoring the use of software inside a computer, vendors could dispense with copy protection altogether.

Cox is a software developer specializing in a new species of modular software code called object-oriented programming (OOP). OOP delivers two magnificent improvements over conventional software. First, OOP provides the user with applications that are more fluid, more interoperable with various tasks — sort of like a house with movable "object" furniture instead of a house saddled with built-in furniture. Second, OOP provides software developers the ability to "reuse" modules of software, whether they wrote the modules themselves or purchased them from someone else. To build a database, an OOP designer like Cox takes a sort routine, a field manager, a form generator, an icon handler, etc., and assembles the program, instead of rewriting a working whole from scratch. Cox developed a set of cool OOP objects that he sold to Steve Jobs to use in his Next machine, but selling small bits of modular

code as a regular business has been slow. It is similar to trying to peddle limericks one by one. To recoup the great cost of writing an individual object by selling it outright would garner too few sales, but selling it by copy is too hard to monitor or control. But if objects could generate revenue each time a user activated them, then an author could make a living creating them.

While contemplating the possible market for OOP objects that were sold on a "per-use" plan, Cox uncovered the natural grain in networked intelligence: Let the copies flow, and pay per use. He says, "The premise is that copy protection is exactly the wrong idea for intangible, easily copied goods such as software. You want information-age goods to be freely distributed and freely acquired via whatever distribution means you want. You are positively encouraged to download software from networks, give copies to your friends, or send it as junk mail to people you've never met. Broadcast my software from satellites. Please!"

Cox adds (in echo of Peter Sprague, although, surprisingly, the two are unfamiliar with each other's work): "This generosity is possible because the software is actually 'meterware.' It has strings attached that make revenue collection independent of how the software was distributed."

Cox calls this system "superdistribution," a name given by Japanese researchers to a similar method they devised to track the flow of software through a network. "The approach is called superdistribution," Cox says, "because, like superconductivity, it lets information flow freely, without resistance from copy protection or piracy." The model is the successful balance of copyright and userights worked out by the music and radio industries. Musicians earn money not

only by selling customers a copy of their work, but by selling broadcast stations a "use" of their music. The copies are supplied free, sent to radio stations in a great flood by the musicians' agents. The stations sort through this tide of free music, paying royalties only for the music they broadcast, as metered (statistically) by two agencies representing musicians, ASCAP and BMI.

JEIDA, a Japanese consortium of computer manufacturers, developed a chip and a protocol that allows each Macintosh on a network to freely replicate software while metering userights. According to Ryoichi Mori, the head of JEIDA, "Each computer is thought of as a station that broadcasts, not the software itself, but the use of the software, to an audience of a single 'listener.'" Each time your Mac "plays" a piece of software, or a software component from among thousands freely available, it triggers a royalty. Commercial radio and TV provide an "existence proof" of a working superdistribution system, in which the copies are disseminated free and the stations only pay for what they use. Musicians would be quite happy if one radio station made copies of their tapes and distributed them to other stations ("Free the bits!"), because it increases the likelihood of some station using their music.

JEIDA envisions software percolating through large computer networks unencumbered by restrictions on copying or mobility. Like Cox, Sprague, and the cypherpunks, JEIDA counts on public-key encryption to keep these counts private and untampered as they are transmitted to the credit center. Peter Sprague says plainly, "Encrypted metering is an ASCAP for intellectual property."

Cox's electronically disseminated pamphlet on superdistribution sums up the virtues very nicely:

Whereas software's ease of replication is a liability today, superdistribution makes it an

asset. Whereas software vendors must spend heavily to overcome software's invisibility, superdistribution thrusts software out into the world to serve as its own advertisement. Whereas the personal computer revolution isolates individuals inside a standalone personal computer, superdistribution establishes a cooperative/competitive community around an information age market economy.

A hoary ogre known as the Pay-Per-View Problem haunts the information economy. In the past this monster ate billions of dollars in failed corporate attempts to sell movies, databases, or music recordings on a per-view or per-use basis. The ogre still lives. The problem is, people are reluctant to pay in advance for information they haven't seen because of their hunch that they might not find it useful. They are equally unwilling to pay after they have seen it, because their hunch usually proves correct: they could have lived without it. Can you imagine being asked to pay after you've seen a movie? Medical knowledge is the only type of information that can be easily sold sight unseen, because the buyers believe they can't live without it.

The ogre is usually slain with sampling. Moviegoers are persuaded to pay beforehand by lapel-grabbing trailers. Software is loaned among friends for trial; books and magazines are browsed in the bookstore.

The other way to slay the problem is by lowering the price of admission. Newspapers are cheap: we pay before looking. The ingenious thing about information-metering is that it delivers two solutions: it provides a spigot that records how much data is used, and it provides a spigot that can be turned down to a cheap trickle. Encryption metering chops big expensive data hunks into small inexpensive doses of data. People will readily pay for bits of cheap information before viewing, par-

ticularly if the payment invisibly deducts itself from an account.

The fine granularity of information-metering gets Peter Sprague excited. When asked for an example of how fine it could get, he volunteers one so fast it's obvious that he has been giving it some thought. "Say you want to write obscene limericks from your house in Telluride, Colorado. If you could write one obscene limerick a day, we can probably find 10,000 people in the world who want to pay ten cents a day to get it. We'll collect \$365,000 per year and pay you \$120,000, and then you can ski for the rest of your life." In no other kind of marketplace would one measly limerick, no matter how bawdy and clever, be worth selling on its own. Maybe a book of them — an ocean of limericks — but not one. Yet in an electronic marketplace, a single limerick — the information equivalent of a stick of gum — is worth producing and offering for sale.

Sprague ticks off a list of other fine-grained items that might be traded in such a marketplace. He catalogs what he'd pay for right now: "I want the weather in Prague for twenty-five cents per month, I want my stocks updated for 50 cents a stock, I want the *Dines Letter* for \$12 a week, I want the congestion report from O'Hare Airport updated continuously because I'm always getting stuck in Chicago, so I'll pay a buck per month for that, and I want 'Hagar the Horrible' for a nickel a day." Each of these products is currently either given away scattershot, or peddled in the aggregate very expensively. Sprague's electronically mediated marketplace would "unbundle" the data, and deliver a narrowly selected piece of information to your desktop or mobile palmtop for a reasonable price. Encryption would meter it out, preventing you from filching other tiny bits of data that would hardly be worth protecting (or selling) in other ways. In essence, the ocean of information flows through you, but you only pay for what you drink.

At the moment, this particular technology of disconnection exists as a \$95 circuitboard that can slide into a personal computer and plug into a phone line. To encourage established computer manufacturers such as Hewlett-Packard and Kalieda to hardwire a similar board into units coming off their assembly line, Sprague's company, Waves, Inc., offers manufacturers a percentage of the revenue the encryption system generates. Their first market is lawyers, "because lawyers spend \$400 a month on information searches." Sprague's next step is to compress the encrypto-metering circuits and the modem down into a single \$20 microchip that can be tucked into beepers, video recorders, phones, radios, and anything else that dispenses information. Ordinarily, this vision might be dismissed as the pipe dream of a starry-eyed junior inventor, but Peter Sprague is chairman and founder of National Semiconductor. He is sort of a Henry Ford of silicon chips. A cypherpunk: not. If anyone knows how to squeeze a revolutionary economy onto the head of a pin, it might be him.

● Digital Cash

This anticipated information economy still lacks one vital component — an ingredient that, once again, is enabled by encryption, and a key element that, once again, only long-haired crypto-rebels are experimenting with: electronic cash.

We already have electronic money. It flows daily in great invisible rivers from bank vault to bank vault, from broker to broker, from country to country, from your employer to your bank account. One institution alone, the Clearing House Interbank Payment System, currently moves an average of one trillion dollars (a million millions) each day via wire and satellite.

But that river of numbers is *institutional* electronic money, as remote

□ True digital cash is real money, with the nimbleness of electricity and the privacy of cash.

from electronic cash as mainframes are from PCs. When pocket cash goes digital — de-massified into data in the same transformation that institutional money underwent — we'll experience the deepest consequences of an information economy. Just as computing machines did not reorganize society until individuals plugged into them outside of institutions, the full effects of electronic economy will have to wait until everyday petty-cash (and check) transactions of individuals go digital.

We have a hint of digital cash in credit cards and ATMs. Like most of my generation, I get the little cash I use at an ATM, not having been inside a bank in years. On average, I use less cash every month. High-octane executives fly around the country purchasing everything on the go — meals, rooms, cabs, supplies, presents — carrying no more than \$50 in their wallets. Already, the cashless society is real for some.

Today in the US, credit-card purchases are used for one-tenth of all consumer payments. Credit-card companies salivate, envisioning a near future where people routinely use their cards for "virtually every kind of transaction." Visa U.S.A. is experimenting with card-based electronic money terminals (no slip to sign) at fast-food shops and grocery stores. Since 1975, Visa has issued over 20 million debit cards that deduct money from one's bank account. In essence, Visa moved ATMs off of bank walls and onto the front counters of stores.

The conventional view of cashless money thus touted by banks and most futurists is not much more than a pervasive extension of the generic credit-card system now operating. Alice has an account at National Trust Me Bank. The bank issues her one of their handy-dandy smart cards. She goes to an ATM and loads the wallet-size debit card with \$300 cash, deducted from her checking account. She can spend her \$300 from the card at any store, gas station, ticket counter, or phone booth that has a Trust Me smart-card slot.

What's wrong with this picture? Most folks would prefer this system over passing around portraits of dead presidents. Or over indebtedness to Visa or MasterCard. But this version of the cashless concept slights both user and merchant; therefore it has slept on the drawing boards for years, and will probably die there.

Foremost among the debit (or credit) card's weaknesses is its nasty habit of leaving every merchant Alice buys from — newsstand to nursery — with a personalized history of her purchases. The record of a single store is not worrisome. But each store's file of Alice's spending is indexed with her bank account number

or Social Security number. That makes it all too easy — and inevitable — for her spending histories to be combined, store to store, into an exact, extremely desirable marketing profile of her. Such a monetary dossier holds valuable information (not to mention private data) about her. She has no control over it, and derives no compensation from it.

Second, the bank is obliged to hand out whiz-bang smart cards. Banks being legendary cheapskates, you know who is going to pay for them, at bank rates. Alice will also have to pay the bank for the transaction costs of using the money card.

Third, merchants pay the system a small percentage whenever a debit card is used. This eats into their already-small profits and discourages vendors from soliciting the card's use for small purchases.

Fourth, Alice can only use her money at establishments equipped with slots that accept Trust Me's proprietary technology. This hardware quarantine has been a prime factor in the non-happening of this future. It also eliminates person-to-person payments (unless you want to carry a slot around, for others to poke into). Furthermore, Alice can only refill her card account (essentially, purchase money) at an official Trust Me ATM

branch. This obstacle could be surmounted by a cooperative network of banks using a universal slot linked into an internet of all banks; a hint of such a network already exists.

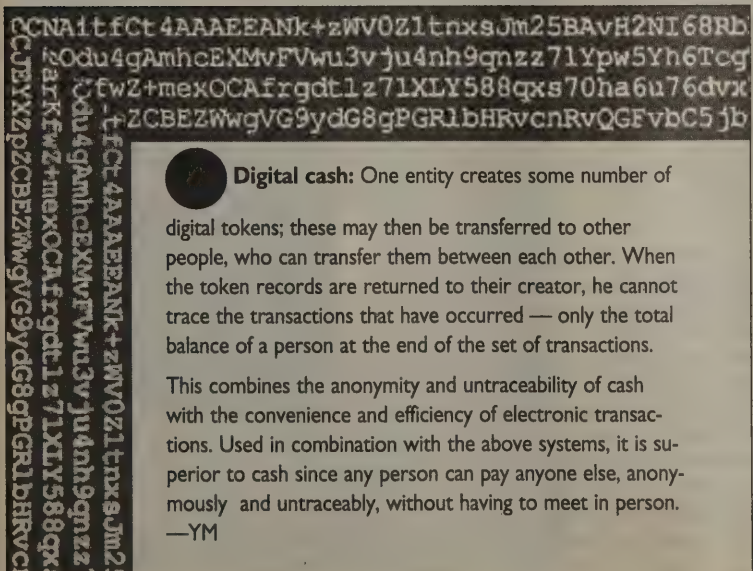
The alternative to debit-card cash is true digital cash. Digital cash has none of the debit card's drawbacks.

True digital cash is real money, with the nimbleness of electricity and the privacy of cash. Payments are accountable, but unlinkable. The cash does not demand proprietary hardware or software. Therefore, money can be received or transferred from and to anywhere, including to and from other individuals. You don't need to be a store or institution to get paid in "non-paper" money. Anyone connected can collect. And any company with the right reputation can "sell" electronic-money refills, so the costs are at market rates. Banks are only peripherally involved. You use digital cash to order a pizza, pay for a bridge toll, or reimburse a friend, as well as to pay the mortgage, if you want. It is different from plain old electronic money in that it can be anonymous and untraceable, except by the payer. It is fueled by encryption.

The method, technically known as blinded digital signatures, is based on a variant of public-key encryption. Here's how it works at the consumer level. You use a digicash card to pay Joe's Meat Market for a prime roast. The merchant can verify (by examining the digital signature of the bank issuing the money) that he has been paid with money that has not been spent before. Yet he'll have no record of *who* paid him. After the transaction, the bank has a verifiable account that you spent \$7, and spent it only once, and that Joe's Meat Market did indeed receive \$7. But those two sides of the transaction are not linked, and cannot be reconstructed, unless you the payer enable them to be. It seems illogical at first that such blind, but verifiable, transactions can occur; but the integrity of their

Digital cash: One entity creates some number of digital tokens; these may then be transferred to other people, who can transfer them between each other. When the token records are returned to their creator, he cannot trace the transactions that have occurred — only the total balance of a person at the end of the set of transactions.

This combines the anonymity and untraceability of cash with the convenience and efficiency of electronic transactions. Used in combination with the above systems, it is superior to cash since any person can pay anyone else, anonymously and untraceably, without having to meet in person. —YM



"disconnection" is pretty watertight. Digital cash can replace every use of pocket cash, except flipping a coin. You have a complete record of all your payments, and to whom they were made.

The privacy and agility of digital cash stems from a simple and clever technology. When I ask a digicash-card entrepreneur if I can see one of his smart cards, he says that he's sorry. He thought he had put one in his wallet, but can't find it. It looks like a regular credit card, he says, showing me his very small collection of them. It looks like . . . why, here it is! He slips out a blank, very thin, flexible card. The plastic rectangle holds math money. In one corner is a small gold square the dimensions of a thumbnail. This is a computer. The CPU, no larger than a soggy cornflake, contains a limited amount of cash, say \$500 or 100 transactions, whichever comes first. This one, made by Cylink², contains a co-processor specifically designed to handle public-key encryption mathematics. On the computer's gold square are six very minute surface contacts, which connect with an online computer when the card is inserted into a slot.

Less-smart cards (they don't do encryption) are big in Europe and Japan, where 61 million of them are already in use. Japan is afloat in a primitive type of electronic currency — prepaid magnetic phone cards. The Japanese national phone company, NTT, has so far sold 330 million (some 10 million per month) of them. Forty percent of the French carry smart cards in their wallets today to make phone calls. New York City recently introduced a cashless phone card for a few of its 58,000 public phone booths. New York is motivated not by futurism, but by thieves. According to *The New York Times*, "Every three minutes, a

2 Cylink manufactures encryption gear for all kinds of commercial uses. 310 N. Mary Avenue, Sunnyvale, CA 94086; 408/735-5800.

thief, a vandal, or some other telephone thug beaks into a coin box or yanks a handset from a socket. That's more than 175,000 times a year," and it costs the city \$10 million annually for repairs. The disposable phone card New York uses is not very smart, but it's adequate. It employs an infrared optical memory, common in European phone cards, which is hard to counterfeit in small quantities but cheap to manufacture in large numbers.

In Denmark, smart cards substitute for the credit cards the Danes never got. So everyone who would tote a credit card in America, packs a smart debit card in Denmark. Danish law demanded two significant restrictions: 1) that there be no minimum purchase amount; 2) that there be no surcharge for the card's use. The immediate effect was that the cards began to replace cash in everyday use, even more than checks and credit cards have replaced cash in the

States. The popularity of these cards is their undoing, because unlike cheap, decentralized phone cards, these cards rely on real-time interactions with banks. They are overloading the Danish banking system, hogging phone lines as the sale of each piece of candy is transmitted to the central bank, flooding the system with transactions that cost more than they are worth.

David Chaum, a Berkeley cryptographer now living in Holland, has a solution. Chaum, head of the cryptography group at the Center for Mathematics and Computer Science in Amsterdam, has proposed a mathematical code for a distributed, true digital-cash system. In his solution, everyone carries around a refillable smart card that packs anonymous cash. This digicash seamlessly intermingles with electronic cash from

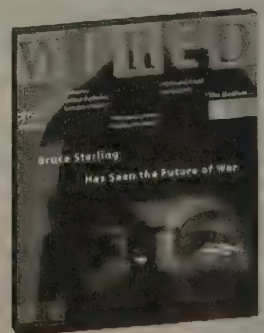
Wired

*In his spare time, Kevin Kelly is executive editor of the hottest new magazine in the U.S. A California reincarnation of the long-admired European magazine **Electric Word**, **Wired** explores and reports the cultural dimensions of new media. Neither cynical nor ga-ga but openly curious about what the new electronic environment means, the reporters include veterans such as Nicholas Negroponte, John Markoff, Steven Levy, Bruce Sterling, Art Kleiner, and Gerard van der Leun. (And me, when I feel like getting paid decently.) The premiere issue sold out its initial 150,000 copies and got an unexpected flood of subscribers. Deservedly so. —SB*

● Information is the fuel that feeds the Otaku's worshiped dissemination systems — computer bulletin-boards, modems, faxes. For Otaku, the only thing that matters is the accuracy of the answer, not its relevance. No piece of information is too trivial for consideration: for instance, for a monster Otaku — an Otaku into TV and Manga monsters — the names of the various actors who wore the rubber suits in an *Ultraman* episode where Ultraman is conspicuously shorter than in other shows is

precious currency. For military Otaku, it's the name of the manufacturer of 55mm armor-piercing ammunition for the PZKIII tank. For idol Otaku — fanatics who follow the endless parade of cute girl pop singers — it's the specific university the father of darling idol Hikaru Nishida attended. Anything qualifies, as long as it was not previously known. —Karl Taro Greenfeld

■ The Battle of 73 Easting [in the Gulf War] has become the single most accurately re-



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home, company, or government. And it works offline, freeing the phone system.

Chaum looks like a Berkeley stereotype: grey beard, full mane of hair tied back in a ponytail, tweed jacket, sandals. As a grad student, Chaum got interested in the prospects and problems of electronic voting. For his thesis, he worked on the idea of a digital signature that could not be faked, an essential tool for fraudproof electronic elections. From there his interest drifted to the similar problem in computer network communications: how can you be sure a document is really from who it claims to be from? At the same time he wondered: how can you keep certain information private and untraceable? Both directions — security and privacy — led to cryptography and a Ph.D. in that subject.

Sometime in 1978, Chaum says, "I

had this flash of inspiration that it was possible to make a database of people so that someone could *not* link them all together, yet you could prove everything about them was correct. At the time, I was trying to convince myself that it was not possible, but I saw a loophole, how you might do it, and I thought, gee . . . But it wasn't until 1984 or '85 that I figured out how to actually do that."

"Unconditional untraceability" is what Chaum calls his innovation. When this code is integrated with the "practically unbreakable security" of a standard public-key encryption code, the combined encryption scheme can provide anonymous electronic money, among other things. Chaum's encrypted cash (to date, none of the other systems anywhere are encrypted) offers several important practical improvements in a card-based electronic currency.

First, it offers the bonafide privacy of material cash. In the past, if you

bought a subversive pamphlet from a merchant for a dollar, he had a dollar that was definitely a dollar and could be paid to anyone else; but he had no record of who gave him that dollar, or any way to provably reconstruct who gave it to him. In Chaum's digital cash, the merchant likewise gets a digital dollar transferred from your card (or from an online account), and the bank can prove that indeed he definitely has one dollar there and no more and no less, but no one (except you if you want) can prove where that dollar came from.

One minor caveat: the smart-card versions of cash so far implemented are, alas, as vulnerable and valuable as cash if lost or stolen. However, encrypting them with a PIN password would make them substantially more secure, though also slightly more hassle to use. Chaum predicts that users of digicash will use short (four-digit) PINs (or none at all) for minor transactions, and longer passwords for major ones. Speculating a bit, Chaum says, "To protect herself from a robber who might force her to give up her passwords at gunpoint, Alice could use a 'duress code' that would cause the card to appear to operate normally, while hiding its more valuable assets."

Second, Chaum's card-based system works offline. It does not require instant verification via phone lines as credit cards do, so the costs are minimal and perfect for the numerous small-time cash transactions people want them for — parking meters, restaurant meals, bus rides, phone calls, groceries. Transaction records are ganged together and zapped once a day, say, to the central accountant computer.

During this day's delay, it would theoretically be possible to cheat.

Electronic money systems dealing in larger amounts, running online in almost real time, have a smaller window of opportunity for cheating — the instant between sending and receiving — but the minute opportunity is still there. While it is not

corded combat engagement in human history. Army historians and simulation modelers thoroughly interviewed the American participants, and paced the

battlefield meter by meter. They came up with a fully interactive, network-capable digital replica of the events at 73 Easting, right down to the last TOW missile and .50-caliber pockmark.

Military historians and armchair strategists can now fly over the virtual battlefield in the "stealth vehicle," the so-called "SIMNET flying carpet," viewing the 3-D virtual landscape from any angle during any moment of the battle. They can even change the parameters — give the Iraqis infrared targeting scopes, for instance, which they lacked at the time, and which made them sitting ducks for high-tech American MIs charging out of blowing sand. The whole triumphal blitzkrieg can be pondered over repeatedly (gloated over even), in perfect scratch-free digital fidelity.

—Bruce Sterling



From: deltorto@aol.com
To: cypherpunks@toad.com
Subject: FWEE!: Whistleblower progress update
Date: Thu, 04 Mar 93 06:30:01 EST
Message-Id: <9303040630.tn06635@aol.com>

I suppose that everyone has by now heard about Bill Clinton's 800 numbers for government waste whistleblowers and anyone else to call. A great idea, and I applaud him for it (it'll keep Al Gore out of trouble for a while), but it's "kid stuff" compared to the picture I have in my mind for our Whistleblowers anonymous remailer system. Eventually, I would like to see anon msgs (some encrypted) alerting specific investigators about assassinations, military cost overruns, govt sex scandals, private sector insider trading and all sorts of other nefarious goings-on. This is gonna be GREAT! We're gonna "rock the world" of the rats out there. . . .

Make no mistake, this is no small job: it will require a team effort. Prepare to be called on for small jobs, and feel free to refuse if the work is out of your league or if you haven't enough time. It'll get done: the People are counting on us. . . .

FYI: several Congressperson's offices have drooled audibly over the prospect and may contribute resources or assistance to our effort. I tend to think we should do this ourselves to avoid any sort of indebtedness to any official entity. In addition, a local SF TV news service has expressed real interest in getting a copy of PGP (DOS), so I will soon post a request for someone to supply that to a certain address (stay tuned). Again, I want to stress the importance of a central repository of all PGP versions for distribution for non-profit purposes such as being able to sign on to this list. The importance of ensuring that the software at this site is not compromised in any way is crucial, just to state the obvious.

PS: In future, I will be receiving mail from the Cypherpunks list at <internaut@aol.com>. any personal msgs can still be sent to me at <deltorto@aol.com>.

-----BEGIN PGP PUBLIC KEY BLOCK-----

Version: 2.1e

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j5ParKfwZ+mexOCAfrgdtlz7lXLY588qxs70ha6u76dvxUsdw6HBOF9KrwDIAAUT
tCJEYXZpZCBEZWwgVG9ydg8gPGRlBHRvcnRvQGfVbC5jB20+
=YGwT
```

-----END PGP PUBLIC KEY BLOCK-----

----- End of Forwarded Message

theoretically possible to break the privacy aspect of digital cash (who paid who), if you were desperate enough for small cash, you could break the security aspect — has this money been spent? — with super-computers. By breaking the RSA public-key code, you could use the compromised key to spend money more than once. That is, until the information was submitted to the bank and they caught you. For, in a delicious quirk, Chaum's digital cash is untraceable *unless* you try to cheat by spending money more than once. When that happens, the extra bit of information the twice-spent money now carries is enough to trace the payer. So electronic money is as anonymous as cash, except for cheaters!

Because of its cheaper costs, the Danish government is making plans to switch from the Dencard to the Dencoin, an offline system suited to small change. The computational overhead needed to run a system like this is nano-small. Each encrypted transaction on a smart card consumes only 64 bytes. (The previous sentence contains 67 bytes.) A household's yearly financial record of all income and expenditures would easily fit on one high-density floppy disk. Chaum calculates that the existing mainframe computers in banks would have more than adequate computational horsepower to handle digital cash. The encryption safeguards of an offline system would reduce much of the transactional computation that occurs on line over phone lines (for ATMs and credit-card checks), enabling the same banking computers to cover the increase in electronic cash. Even if we assume that Chaum guessed wrong about the computational demands of a scaled-up system, and that he is off by a factor of ten, computer speed is accelerating so fast that this defers the feasibility of using existing bank power by only a few years.

In variations on Chaum's basic de-

By its decentralized, distributed nature, encrypted e-money has the same potential for transforming economic structure as personal computers did for overhauling management and communication structure.

sign, people may also have computer appliances at home, loaded with digital-cash software, which allow them to pay other individuals, and get paid, over phone lines. This would be e-money on the networks. Attached to your email message to your daughter is an electronic \$100 bill. She may use that cash to purchase, via email, an airplane ticket home. The airline sends the cash to one of their vendors, the flight's meal caterer. In Chaum's system nobody has any trace of the money's path. Email and digital cash are a match made in heaven. Digital cash could fail in real life, but it is almost certain to flourish in computer networking society.

I asked Chaum what banks think of digital cash. His company³ has visited or been visited by most of the big players; do they say, Gee, this threatens our business? Or do they say, Hmm, this strengthens us, makes us more efficient? Chaum: "Well, it ranges. I find the corporate planners in \$1,000 suits and private dining halls are more interested in it than the lower-level systems guys, because the planners' job is to look to the future. Banks don't go about building stuff themselves. They have their systems guys buy stuff from vendors. My company is the first vendor of electronic money. I have a

very extensive portfolio of patents on electronic money, in the US, Europe and elsewhere." Some of Chaum's crypto-anarcho friends give him a hard time about taking out patents on this work. Chaum tells me in defense, "It turns out that I was in the field very early, so I wiped out all the basic problems. So most of the new work now [in encrypted electronic money] are extensions and applications of the basic work I did. The thing is, banks don't want to invest into something that is unprotected. Patents are very helpful in making electronic money happen."

Chaum is an idealist. He sees security and privacy as a trade-off. His larger agenda is providing tools for privacy in a networked world, so that privacy can be balanced with security. In the economics of networks, costs are disproportionately dependent on the number of other users. To get the Fax Effect going, you need a critical mass of early adopters. Once beyond the threshold, the event is unstoppable because it is self-reinforcing. Electronic cash shows all the signs of having a lower critical-mass threshold than other implementations of data privacy. Chaum is betting that an electronic cash system inside an email network, or a card-based electronic cash for a local public transportation network, has the lowest critical mass of all.

The most eager current customers for digital cash are European city officials. They see card-based digital cash as the next step beyond the magnetic fast-passes now issued regularly by most cities' bus and subway departments. One card is filled with as much bus money as you want. But there are added advantages: the same card could fit into parking meters, when you did drive, or be used on trains for longer-distance travel.

Urban planners love the idea of automatic tolls charging vehicles for downtown entry or crossing a bridge, without having the car stop or slow down. Bar-code lasers can identify

moving cars on the road, and drivers will accept purchasing vouchers. What's holding up a finer-grain toll system is the Orwellian fear that "THEY will have a record of my car's travels." Despite that fear, automatic tolls that record the cars' identity are already operating in Oklahoma, Louisiana, and Texas. Three states in the busy Northeast have agreed to install one compatible system, starting with experimental setups on two Manhattan/New Jersey bridges. In this system, a tiny card-size radio taped to the car windshield transmits signals to the toll gate, which deducts the toll from your account at the gate (not from the card). Similar equipment running on the Texas turnpike system is 99.99 percent reliable. These proven toll mechanisms could easily be modified to Chaum's untraceable encrypted payments, and true electronic cash, if people wanted.

In this way, the same cash card that pays for public transportation can also be used to cover fees for private transportation. Chaum relates that in his experience with European cities, the Fax Effect — the more people online = the more incentive to join — takes hold, quickly drawing other uses. Officials from the phone company get wind of what's up and make it known that they would like to use the card to rid themselves of a nasty plague called "coins" that bog public phones down. Newspaper vendors call to inquire if they can use the card . . . soon the economics of networks begin to take over.

Ubiquitous digital cash dovetails well with massive electronic networks. It's a pretty sound bet that Internet — today's version of the Net — will be the first place that e-money will infiltrate deeply. Money is another type of information, a compact type of control. As the net expands, money expands. Wherever information goes, money is sure to follow. By its decentralized, distributed nature,

³ Digidash, CWI, Kruislaan 413, 1098 SJ Amsterdam, The Netherlands; 31/20-592-4104.

encrypted e-money has the same potential for transforming economic structure as personal computers did for overhauling management and communication structure. Most importantly, the privacy/security innovations needed for e-money are instrumental in developing the next level of adaptive complexity in an information-based society. I'd go so far as to say that truly digital money — or, more accurately, the economic mechanics needed for truly digital cash — will rewire the nature of our economy, communications, and knowledge.

The consequential effects of electronic money are already underway. Four we can expect are:

- *Increased velocity.* When money is disembodied — removed from any material basis at all — it speeds up. It travels farther, faster. Circulating money faster has an effect similar to circulating more money. When satellites went up, enabling near-the-speed-of-light round-the-clock world stock trade, they expanded the *amount* of global money by 5 percent. Digital cash used on a large scale will further increase money's velocity.

- *Continuity.* Money that is composed of gold, precious materials, or paper comes in fixed units that are paid at fixed times. The ATM spits out \$20 bills; that's it. You pay the phone company once a month, even though you use the phone every day. This is batch-mode money. Electronic money is continuous-flow. It allows recurring expenses to be paid, in Alvin Toffler's phrase, by "bleeding electronically from one's bank account in tiny droplets, on a minute-by-minute basis." Your e-money account pays for each phone call as soon as you hang up, or — how about this — *as you are talking*. Payment coincides with use. Together with its higher velocity, continuous electronic money can approach near instantaneity. This puts a crimp on banks, which derive a lot of their current profit on the "float" — which instantaneity erases.

- *Unlimited fungibility.* Finally, *really* plastic money. Once completely disembodied, digitized money escapes from a single transmission form and merrily migrates to whatever medium is handiest. Separate billing fades away. Accounts can be interleaved with the object or service itself. The bill for a video comes incorporated into the video. Invoices reside alongside of bar codes, and can be paid with the zap of a laser. Anything that can hold an electronic charge can hold a fiscal charge. Foreign currencies become a matter of changing a symbol. Money is as malleable as digitized information. This makes it all the easier to monetize exchanges and interactions that were never part of an economy before. It opens the floodgates of commerce onto the net.

- *Accessibility.* Until now, sophisticated manipulations of money have been the private domain of professional financial institutions — a financial priesthood. But just as a million Macs broke the monopoly of the high priests guarding access to main-frame computers, so e-money will break the monopoly of financial Brahmins. Imagine if you could charge (and get) interest on any money due you by dragging an icon over that electronic invoice. Imagine if you could factor in the "interest due" icon, and give it variable interest, ballooning as it aged. Or maybe you would charge interest by the minute if you sent a payment in early. Or program your personal computer to differentially pay bills depending on the prime rate — programmed bill-trading for amateurs. Or perhaps you would engineer your computer to play with exchange rates, paying bills in whatever currency is least valuable at the time. All manner of clever financial instruments will surface once the masses can drink from the same river of electronic money as the pros. To the list of things to hack, we may now add finance. We are headed toward programmed capitalism.

The minting and issuing of currency has been one of the few remaining functions of government that the private sector has not encroached upon. E-money will lower this formidable barrier.

- *Privatization.* The ease with which e-money is caught, flung, and shaped makes it ideal for private currencies. The 214 billion yen tied up by Japan's NTT's phone cards is one limited type of private currency. The law of the net is: he who owns a computer not only owns a printing press, but also a mint, when that computer is linked to e-money. Para-currencies can pop up anywhere there is trust (and fail there, too).

Historically, most modern barter networks rapidly slide into exchanges of real currency; one could expect the same in electronic barter clubs, but the blinding efficiency of an e-money system may not tend that way. The \$350 billion tax question is whether para-currency networks would ever rise above unofficial status.

The minting and issuing of currency has been one of the few remaining functions of government that the private sector has not encroached upon. E-money will lower this formidable barrier. By doing so it will provide a powerful tool to private governance systems, such as might be established by renegade ethnic groups, or the "edge cities" proliferating near the world's megacities. The use of institutional electronic money transfers to launder money on a global scale is already out of anyone's control.

The Yin of the Network's Yang

The nature of e-money — invisible, lightning-quick, cheap, globally penetrating — is likely to produce indelible underground economies, a worry way beyond mere laundering of drug money. In the net-world, where a global economy is rooted in distributed knowledge and decentralized control, e-money is not an option but a necessity. Para-currencies will flourish as the Grand Net flourishes. The electronic matrix is destined to be an outback of hardy *underwire* economies. The net is so amicable to electronic cash that once established interstitially in the net's links, e-money is probably ineradicable.

In fact, the legality of anonymous digital cash is in limbo from the start. There are now strict limits to the size of transactions US citizens can make with physical cash; try depositing \$10,000 in greenbacks in a bank. At what amount will the government limit anonymous digital cash? The drift of all governments is to demand fuller and fuller disclosures of financial transactions (to make sure they get their cut of tax) and to halt unlawful transactions (as in the War on Drugs). The prospect of allowing untraceable commerce to bloom on a federally subsidized network would probably have the US government seriously worried, if they were thinking about it. But they aren't. A cashless society smells like stale science fiction, and the phrase reminds every bureaucrat drowning in paper of the unfulfilled predictions of a paperless society. Eric Hughes, maintainer of the cypherpunks' mailing list, says,

■ "The Really Big Question is, how large can the flow of money on the nets get before the government requires reporting of every small transaction? Because if the flows can get large enough, past some threshold, then there might be enough aggregate money to provide an economic incentive for a transnational service

to issue money, and it wouldn't matter what one government does."

Hughes envisions multiple outlets for electronic money springing up all over the global net. The vendors would act like traveler's-check companies. They would issue e-money for, say, a 1 percent surcharge. You could then spend Internet Express checks wherever anyone accepted them. But somewhere on the global net, underwire economies would dawn, perhaps sponsored by the governments of struggling developing countries. Like the Swiss banks of old, these digital banks would offer unreported transactions. Paying in online Nigerian nairas from a house in Connecticut would be no more difficult than using US dollars. "The interesting market experiment," Hughes says, "is to see what the difference in the charge for anonymous money is, once the market equalizes. I bet it'll be on the order of 1 to 3 percent higher, with an upper limit of about 10 percent. That amount will be the first real measure of what financial privacy is worth. It might also be the case that anonymous money will be the *only* kind of money."

Usable electronic money may be the most important outcome of a sudden grassroots takeover of the formerly esoteric and forbidden field of codes and ciphers. Everyday e-money is one novel use for encryption that never would have occurred to the military. There are certainly many potential uses of encryption that the cypherpunks' own ideological leanings blind them to, and that will have to wait until encryption technology enters the mainstream — as it certainly will.

To date, encryption has birthed the following: digital signatures, blind credentials (you have a diploma that says: Yes you have a Ph.D., but no one can link that diploma with your other diploma from traffic school), anonymous email, electronic money. These species of disconnection thrive as networks thrive.

Encryption wins because it is the necessary counterforce to the net's runaway tendency to connect everything. It is a prime technology of disconnection. The net says, "Just connect." The cipher says, "Disconnect." Encipherment is the complementary technology to the technology of cheap copying and linking. Without some force of disconnection, the world would freeze up in an overloaded tangle of unprivate connections and unfiltered information.

I'm listening to the cypherpunks, not because I think that anarchy is a solution to anything, but because it seems to me that encryption technology civilizes the gridlocking avalanche of knowledge and data that networked systems generate. A cipher is the yin for the network's yang, a tiny hidden force that is able to tame the explosive interconnections born of decentralized, distributed systems. ☛

■ "The Really Big Question is, how large can the flow of money on the nets get before the government requires reporting of every small transaction? Because if the flows can get large enough, past some threshold, then there might be enough aggregate money to provide an economic incentive for a transnational service to issue money, and it wouldn't matter what one government does."

—Eric Hughes

Complexity • Complexity

Two simultaneous books by esteemed science journalists with identical book titles suggests that something is up. Indeed it is. The "sciences of complexity," particularly as they are focused, blended, and broadcast through the Santa Fe Institute, are an implosive frontier of science these years, and the questions and research are surprisingly accessible to lay understanding. Even two books don't cover all that's cooking, but they offer an intriguing sampler.

Mitchell Waldrop's book comes at the subject through the experience of a few of the main investigators at the Santa Fe Institute — notably economist Brian Arthur, theoretical biologist Stuart Kauffman, computer adaptivist John Holland, artificial life creator Chris Langton — noting how the stimulation of their ideas on each other leads to the emergent understanding of emergent properties. The process is almost an example of itself. Of the two books, I prefer this one.

Roger Lewin's focus is on evolution and complexity — "complex adaptive systems" — and maybe the evolution of complexity. He branches out from Santa Fe Institute to include discussions with field biologist Edward O. Wilson, Gaia theorist James Lovelock, and consciousness philosopher Daniel Dennett.

Computers have made formerly theoretical sciences into experimental sciences (model your idea and see if it runs), and new comfort with non-linear, chaotic systems means that the models and the real

world are growing ever closer together. And formerly divergent disciplines are converging. Both are good news. —SB

Increasing returns, lock-in, unpredictability, tiny events that have immense historical consequences — "These properties of increasing-returns economics shocked me at first," says [Brian] Arthur. "But when I recognized that each property had a counterpart in the nonlinear physics I was reading, I got very excited. Instead of being shocked, I became fascinated." Economists had actually been talking about such things for generations, he learned. But their efforts had always been isolated and scattered. He felt as though he were recognizing for the first time that all these problems were the same problem. "I found myself walking into Aladdin's cave," he says, "picking up one treasure after another."

By the autumn, everything had fallen into place. On November 5, 1979, he poured it all out. At the top of one page of his notebook he wrote the words "Economics Old and New," and under them listed two columns [see box].

And so it went, for three pages. . . . In Arthur's new economics, the economic world would be part of the human world. It would always be the same, but it would never be the same. It would be fluid, ever-changing, and alive.

In particular, the founding workshops made it clear that every topic of interest had at its heart a system composed of many, many "agents." These agents might be molecules or neurons or species or consumers or even corporations. But whatever their nature, the agents were constantly organizing and reorganizing themselves into larger structures through the clash of mutual accommodation and mutual rivalry. Thus, molecules would form cells, neurons would form brains, species would form ecosystems, consumers and corporations would form economies, and so on. At each level, new emergent structures would form and engage in new emergent behaviors. Complexity, in other words, was really a science of emergence. And the challenge that Cowan had been trying to articulate was to find the fundamental laws of emergence. —M. Mitchell Waldrop

"I set the thing going, and left it to run

Old Economics

- Decreasing returns
- Based on 19th-century physics (equilibrium, stability, deterministic dynamics)
- People identical
- If only there were no externalities and all had equal abilities, we'd reach Nirvana
- Elements are quantities and prices
- No real dynamics in the sense that everything is at equilibrium
- Sees subject as structurally simple
- Economics as soft physics

New Economics

- Much use of increasing returns
- Based on biology (structure, pattern, self-organization, life cycle)
- Focus on individual life; people separate and different
- Externalities and differences become driving force. No Nirvana. System constantly unfolding.
- Elements are patterns and possibilities
- Economy is constantly on the edge of time. It rushes forward, structures constantly coalescing, decaying, changing.
- Sees subject as inherently complex
- Economics as high-complexity science

overnight," Tom [Ray] said, recalling what obviously had been a tense but exquisite moment in his life. "I didn't sleep much." Tom had already glimpsed fragments of life in Tierra during the debugging process. He knew that something was going to happen, something interesting. But he had no way of predicting just how interesting it would be. "All hell broke loose," was how he described what had occurred overnight in his virtual world. "From the original ancestor, parasites very quickly evolved, then creatures that were immune to the parasites," said Tom. "Some of the descendants were smaller than the ancestral organism, some were bigger. There were hyperparasites, social creatures. I saw arms races, cheaters, there was —" Wait a minute, I interrupted, you have to explain these creatures to me. When Tom described himself as a naturalist of a virtual world, he meant it: the digital organisms were as real to him as the ant butterflies had been.

I had noticed many times how, when people talked about the dynamics of complex systems, they used the language of purpose, of goal-seeking behavior. "A co-evolving system gets itself to the edge of chaos," for instance. And, the edge of chaos is a "favored place to be," because "that's where computation is maximized" or because "the system optimizes sustained fitness there." Even the phrase "order out of chaos" has a certain numinous quality to it. I wondered whether Will Provine had been correct, suggesting that the people at the Santa Fe Institute really were seeking the meaning of life, and the clue to their underlying motive was revealed in their language. Or perhaps the dynamics of complex adaptive systems are so powerful, so immanently creative, that the language of purposefulness is hard to avoid.

—Roger Lewin



Complexity

M. Mitchell Waldrop, 1992; 380 pp.

\$23 (\$26 postpaid) from Simon & Schuster/Order Dept., 200 Old Tappan Road, Old Tappan, NJ 07675; 800/223-2336

Complexity

(Life at the Edge of Chaos)

Roger Lewin, 1992; 208 pp.

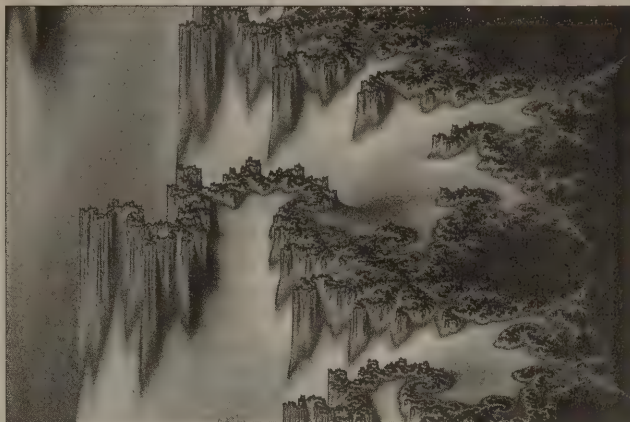
\$22 postpaid from Macmillan Publishing Company, 100 Front Street, Riverside, NJ 08075; 800/257-5755

Fractals

Graphically presenting the concepts of chaos and self-similarity, "Fractals: An Animated Discussion" provides an excellent whole-brain introduction to the science of complex dynamical systems. Threaded on comments by Benoît Mandelbrot and Edward Lorenz, more than half the video consists of high-quality computer-generated animations of the Mandelbrot set, Julia sets, the "infinitely frayed boundaries" of the Cantor set, strange attractors, and other beasts from the land of mathematical complexity.

Our perceptual world is much more fractal than it is Euclidean. Look at anything long enough and it falls apart. Now, thanks to the processing power emerging from rapidly evolving computer systems, we can simulate fractal worlds that begin to approximate the textured and corrugated landscapes of "nature."

Animated fractal imagery is beautiful and truly hypnotic. With luck, our capacity to model fractal dimensions will also generate tools for "seeing" and under-



standing the vast scales at which we affect materiality. (It's about seventeen orders of magnitude from the atoms nanoengineers manipulate to the Earth's ozone layer.)

Some of the mathematics presented here is nontrivial, and anyone who wants to "understand" fractals has some serious thinking ahead. But even the most math-phobic will gain a visceral understanding of the field from this video.

Even the music is based on a simple fractal recursion. Whichever side of C. P. Snow's great divide you hail from, watch this, at least once — with the sound off, the color up, and your favorite molecules flexing those neural receptors.

Eye candy with radical depth and consequence. —BC Crandall

(NB: The same folks sell interactive Macintosh software "The Beauty of Fractals Lab.")

Fractals

(An Animated Discussion With Edward Lorenz and Benoît B. Mandelbrot)

\$59.95

(\$63.95 post-

paid) from

W. H. Freeman

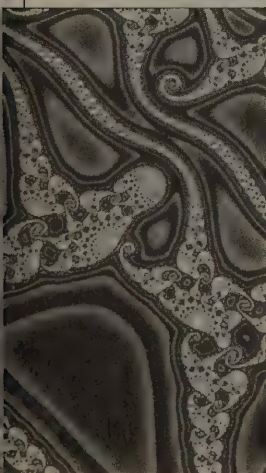
and Co., 4419

W. 1980 S.,

Salt Lake City,

UT 84104;

800/488-5233

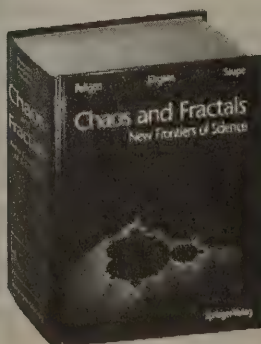


Chaos and Fractals

One of those (unfortunately rare) books that makes you say "aha!" and "wow!" on nearly every page, **Chaos and Fractals** fills a gap that solely needed filling. It's more in-depth and explanatory than James Gleick's **Chaos**, and more accessible than Benoît Mandelbrot's **The Fractal Geometry of Nature**. It is clear but accurate, inspiring without being superficial. The authors assume the reader is intelligent, but don't assume a great deal of mathematical background. Furthermore, most of the chapters are

fairly independent of each other, so you don't have to follow everything in the book in all its detail to get a lot out of it. This book does a good job of showing how chaos and fractals are intimately connected with each other, and, in a sense, are different manifestations of the same thing. Each chapter also has a short BASIC program that computer types can use to play with the key idea of that chapter. —Philip Sharman

Two renderings of a detail of the Mandelbrot set. The 3D rendering shows the height corresponding to the distance to the set (top). The 2D rendering uses colors to represent the distance.

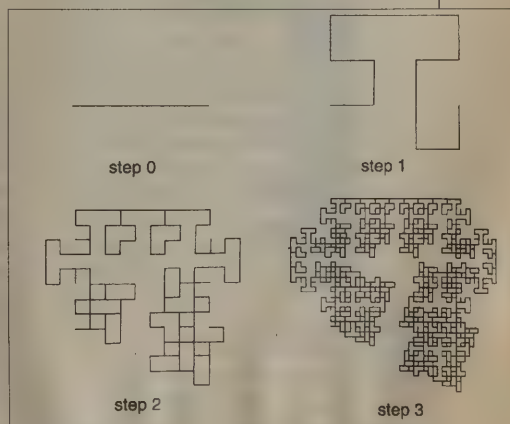


Chaos and Fractals

(New Frontiers of Science)

Heinz-Otto Peitgen,
Hartmut Jürgens, and
Dietmar Saupe, 1992;
1,000 pp.

\$49.50 (\$52 postpaid)
from Springer-Verlag New
York, Inc./Order Dept., 44
Hartz Way, Secaucus, NJ
07096; 201/348-4033



First steps of a curve generation with self-intersections.

Nanosystems

The reader expecting a warm, fuzzy sequel to Drexler's *Engines of Creation* will be disappointed. In *Nanosystems*, Drexler rolls up his sleeves and gets down to business. This is a difficult, ambitious, highly technical condensation of fifteen years of research in molecular nanotechnology — building structures to complex, atomic specifications using sequences of chemical reactions directed by nonbiological molecular machinery.

At this time, our ability to visualize, analyze, and (hypothetically) design most of these systems far outstrips our ability to actually build them. Drexler cheerfully acknowledges this and proceeds in the spirit of what he calls "theoretical applied science" — research based not on the limits of our current technology but on the limits imposed by the laws of physics.

It is a highly interdisciplinary field, a complex hybrid of chemistry, mechanical engineering, and statistical physics, with excursions into computer science, materials science, and elsewhere. Drexler maintains an effective balance by approaching this volume from a design perspective — the objective is to hypothesize workable systems and to assemble a repository of core knowledge in a form that does not require specialization in the component disciplines. Thus, the chemistry should be accessible to the mechanical engineer, the statistical physics within the reach of the computer scientist, and so on. Many of the mathematical results are derived from first principles.

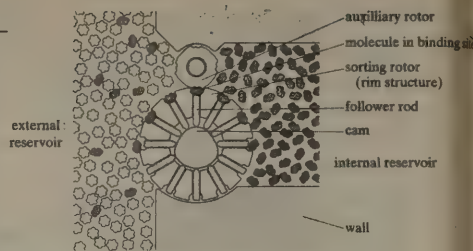
Nanosystems is organized into three parts. Part I examines fundamental physical processes in the context of molecular nanotechnology, isolating those

that are important and taking great pains to justify dismissing others. Its most significant result is that the standard formalism of equilibrium statistical mechanics, with quantum corrections, is adequate for analyzing most molecular mechanical systems.

Part II describes "long-term technologies" — nanoscale component devices such as gears and bearings, leading up to more complex machines — and concludes with a discussion of molecular manufacturing systems capable of producing an object of kilogram scale in a few thousand seconds. This is theoretical applied science in action — hard and rigorous, but dancing out on the edge of speculation.

In Part III, practical applications are discussed, beginning with current technologies and suggesting development paths towards more advanced molecular manufacturing.

As a practitioner in the trenches of applied mathematics and scientific computing, I found Drexler's Appendix on "Methodological Issues in Theoretical



A sorting rotor, with an auxiliary rotor that forces bound molecules to pass through a totally enclosed state, effectively excluding molecular species that are unable to fit within a volume of defined size and shape. The alignment of the primary and auxiliary rotors can be ensured by means of a geared interface (not shown).

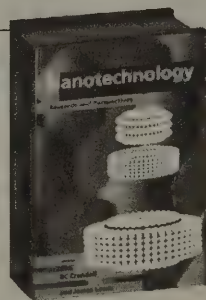
Applied Science" especially thought-provoking.

For the practicing scientist interested in a comprehensive introduction to the field of molecular nanotechnology, or the layperson with a strong science background interested in learning more about the basic principles and capabilities, *Nanosystems* is indispensable. —Daniel L. Marcus

Nanotechnology

An eclectic collection of articles based on presentations given at the First Foresight Conference on Nanotechnology, Palo Alto, 1989. There is something here for everybody — specialized technical articles in theoretical computer science, protein design, speculative engineering of self-assembling molecular machines, and more; general presentations directed at the nonspecialist; panel discussions on enabling strategies for this emergent technology and public policy issues in the development and regulation of nanotechnology; careful musings on economic and environmental implications. The Appendices feature a friendly, accessible introduction by K. Eric Drexler and an astonishingly insightful and prophetic 1960 article by Richard Feynman.

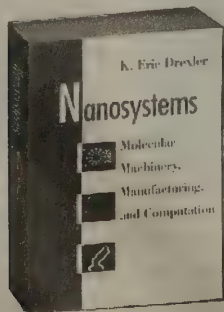
Nanotechnology in its current state offers an opportunity for the scientists and engineers midwifing its emergence to also craft a responsible and conscious policy environment for its implementation. Drexler, one of the leading figures in the field, has made it clear that he considers this a priority. The most appealing feature of this collection is the balance between "hard-tech" articles in the best tradition of speculative science and more general discussions of implications and consequences. —Daniel Marcus



Nanotechnology
(Research and Perspectives)
BC Crandall, 1992; 480 pp.

\$39.95 (\$42.95 postpaid) from The MIT Press/Order Dept., 55 Hayward Street, Cambridge, MA 02142; 800/356-0343

■ We live in bodies made of atoms in a world made of atoms, and how those atoms are arranged makes all the difference. To be healthy is to have tissues and cells made of correctly patterned sets of atoms. To have wealth is, in large measure, to control collections of atoms organized to form useful objects — whether foodstuffs, housing, or spacecraft. If we could arrange atoms as we pleased, we would gain effectively complete control of the structure of matter. Nanotechnology will give us this control, bringing with it possibilities for health, wealth, and capabilities beyond most past imaginings. —K. Eric Drexler



Nanosystems
(Molecular Machinery,
Manufacturing and Computation)

K. Eric Drexler, 1992; 556 pp.

\$24.95 postpaid from John Wiley & Sons, Inc./Eastern Distribution Ctr., 1 Wiley Drive, Somerset, NJ 08873; 800/225-5945

Unbounding the Future

This is the current popular nanotechnology book, replacing Eric Drexler's earlier *Engines of Creation* (1986). It is one of the most exemplary of books about the future, in that it takes responsibility for encouraging public debate about the technology it is pushing, and it employs imaginative and convincing scenario planning.

When molecular engineering takes off, which could begin within the next decade or so, much of our familiar world will become unrecognizable. Even the approach of such a singularity changes things. The nineties will stutter and distort, as the realization sinks in and individuals, companies, and nations shape themselves toward nanotechnological advantage. —SB

The idea of molecular nanotechnology is now about as well accepted as was the idea of flying to the Moon in the pre-space age year of 1950, nineteen years before the *Apollo II* landing and seven years before the shock of *Sputnik*. Those who understand it expect it to happen, but without the cost and uncertainty of a grand national commitment.

Calculators were once thousand-dollar desktop clunkers, but microelectronics made them fast and efficient, sized to a child's pocket and priced to a child's budget. Now imagine a revolution of similar magnitude, but applied to everything else.

Scenario: Cleansing the Air
In Earth's atmosphere, the twentieth-century rise in carbon-dioxide levels has halted and reversed. Fossil fuels are obsolete, so pollution rates have lessened.



Unbounding the Future (The Nanotechnology Revolution)

K. Eric Drexler, Chris Peterson, and Gayle Pergamit, 1991; 304 pp.

\$23 (\$24.50 postpaid) from William Morrow and Co./Wilmore Warehouse, 39 Plymouth Street, Fairfield, NJ 07004; 800/843-9389

Efficient agriculture has freed fertile land for reforestation, so growing trees are cleansing the atmosphere. Surplus solar power from the world's repaved roads is being used to break down excess carbon dioxide at a rate of 5 billion tons per year. Climates are returning to normal, the seas are receding to their historical shores, and ecosystems are beginning the slow process of recovery. In another twenty years, the atmosphere will be back to the pre-industrial composition it had in the year 1800.

[Scanning tunneling microscopes] are no longer exotic: Digital Instruments of Santa Barbara, California, sells its system (the Nanoscope®) by mail with an atomic-resolution-or-your-money-back guarantee.

Fuzzy Logic

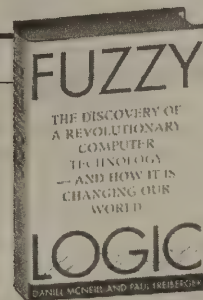
Almost thirty years ago, American (by way of Russia and Iran) scientist Lofti Zadeh came up with a new way of classifying objects — instead of viewing them in distinct classes, he insisted, let's admit that some things overlap. He called it "Fuzzy Logic," and contended that by acknowledging and exploiting the pervasive grey areas in our reality, we can make our machines smarter. It makes sense and (we now know) it works. But ever since Zadeh first presented his ideas to his colleagues at a seminar at Berkeley in 1964, he encountered resistance. After many years of trying to convince people to shift paradigm, he seemingly lost heart — even as a fuzzy-logic Backgammon program became the first software to defeat a world champion.

But someone was listening carefully — in Japan. Fuzzy logic not only gained respect there, but actually took root in products — washing machines, cars, and subway systems. Only now, as an export, are Americans beginning to learn about this new philosophy-cum-technology.

Authors McNeill and Freiberger give us the fascinating basics of this technology, outline the course of its development, and provide a slap in the face to those still clueless on why only Japan, Inc. seems to understand how to exploit the great ideas made in America. Yet what lingers is not so much the theme of international business competition but the bewitching question of fuzzy logic itself. Do our minds work this way? Could be. This book widened my own perspective. Seeing fuzzy is really seeing more clearly. —Steven Levy

Within three years of their commercial introduction, hundreds of STMs had been purchased.

A good companion to the precept "Think globally, act locally" is "Think of the future, act in the present." If everyone were to abandon short-term problems and today's popular causes, the results would be disastrous. But there is no danger of that. The more likely danger is the opposite. The world is heading straight for a disruptive transition with everything at stake, yet 99.9 percent of human effort and attention is going into either short-term concerns or long-term strategies based on a fantasy future of lumbering twentieth-century technology.



Fuzzy Logic

Daniel McNeill and Paul Freiberger, 1993; 319 pp.

\$22 (\$25 postpaid) from Simon & Schuster/Order Dept., 200 Old Tappan Road, Old Tappan, NJ 07675; 800/223-2336

[T]he gifts fuzzy logic has brought to Japan: intelligent washing machines, microwaves, cameras, camcorders, automobiles. Toss a load of clothes into a fuzzy washer and press Start, and the machine begins to churn, automatically choosing the best cycle. Place chili, potatoes, or lasagna in a fuzzy microwave and push a single button, and it cooks for the right time at the proper temperature. Aim a fuzzy camcorder at a birthday party and it stills handheld jitter. The Japanese sell fuzzy TVs, which ironically show sharper pictures. Fuzzy logic is making over cars: cushioning their ride, enhancing safety, and cutting gas consumption by some 15 percent. It is scheduling elevators and traffic lights, and preventing tunnel cave-ins at construction sites. Because of fuzzy logic, the visiting Westerner sees a nation living slightly further in the future.

	TRUTH VALUES	
	CRISP	FUZZY
The Nile (4,180 m.) is a long river	1	1
The Mississippi (2,348 m.) is a long river.	1	0.8
The Danube (1,766 m.) is a long river.	1	0.7
The Rhine (820 m.) is a long river.	0	0.4
The Hudson (306 m.) is a long river.	0	0.2

Reality Rules

Given some "real-world" system — a physics problem, an economic database, an unfolding set of socioeconomic conditions — how can we construct a formal representation of it that makes sense, that illuminates, that allows us to experiment, question, and explore? What are the rules that encode the observables of the system into the model formalism? How do we know if we've done a good job?

Like music improvisation or poetry writing, the art of mathematical modeling cannot be taught. It can, however, be learned, and **Reality Rules** is a thorough, rigorous, and entertaining guide for the would-be modeler. It is more than that, though. Drawing primarily from the theory of dynamical systems, Casti constructs nothing less than a dialectic of modeling — a singular contribution to a field that has been characterized more by its lack of unifying principles than anything else.

His style is unique, weaving together philosophical speculation with nuts-and-bolts, how-to examples. Each section is appended with an excellent collection of exercises, topics for discussion or rumination, longer problems, and a thorough bibliography. Some of the problems are routine, intended for "practice" and gaining familiarity with the formalism. Others are extremely difficult. Applications are drawn from areas as diverse as astrophysics, genetics, sociobiology, and economics.

Reality Rules is organized into two volumes. **Fundamentals** presents what he considers to be the essential tools that a modeler must command; **Frontiers** explores special topics.

Casti's choice of material is, for the most part, thoroughly modern. In addition to the requisite discussions of chaos and fractals, there are excellent sections on cellular automata, pattern formation, artificial life, and the theory of cognition. On the other hand, I found his emphasis on catastrophe theory — essentially a taxonomy for local singularities that achieved some recognition and notoriety in the seventies — to be rather tiresome. But that's largely a matter of taste — there are enough riches here to pick and choose from.

Be forewarned that the "buy-in" to **Reality Rules** is a bit steep. In order to make any sense at all of these books, the reader must have a working familiarity with undergraduate mathematics —

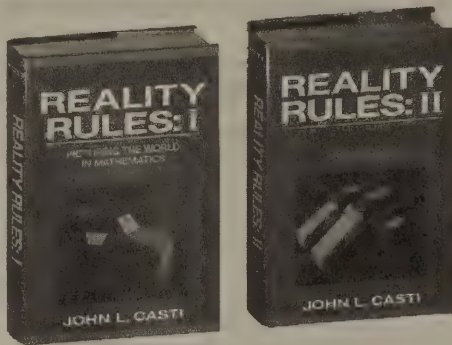
calculus, elementary modern analysis, ordinary differential equations, and linear algebra. I would also consider knowledge of a programming language and access to a computer essential for doing many of the exercises. But with these fundamentals in hand, **Reality Rules** will serve as an incomparable toolkit and a source of inspiration for both the mathematics worker and the armchair philosopher. —Daniel Marcus

• This book is about the ways and means of constructing "good" models of reality, the properties of such models, the means for

encoding specific realities into definite formal systems and the procedures for interpreting the properties of the formal system in terms of the given real world situation. —*The Fundamentals*

• **Evolutionary Epistemology**
In the Darwinian battle for survival, Fortune's formula may be compactly expressed as

heredity + variation + selection = adaptation, encapsulating in four everyday words over a century's worth of scholarly and public debate about the nature of change in living



Reality Rules

(Picturing the World in Mathematics)
John L. Casti, 1992

Volume I: The Fundamentals. 407 pp.

\$39.95 postpaid

Volume II: The Frontier. 444 pp.

\$44.95 postpaid

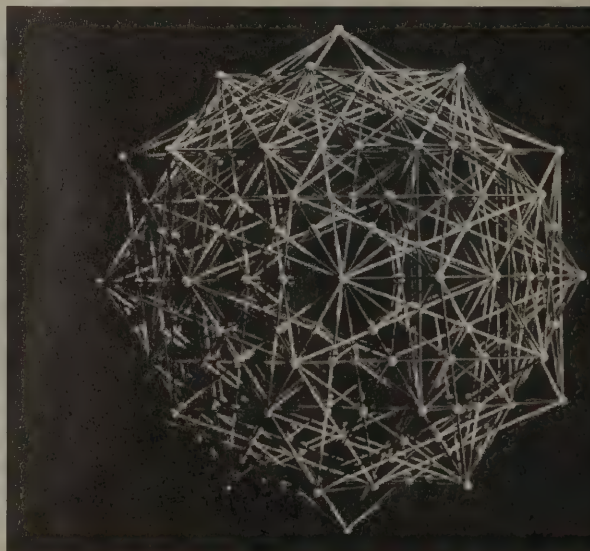
John Wiley & Sons, Inc./Eastern Distribution Ctr., 1 Wiley Drive, Somerset, NJ 08873; 800/225-5945

Zometool

Cheaper and very much easier to understand than CAD (computer-aided design) representations, the Zometool enables you to construct and ponder drastically intricate models of Fullerenes, hypercubes and other structures in two-, three-, and the exciting five-fold symmetries that elude two-dimensional visualization. The Golden Mean is in-

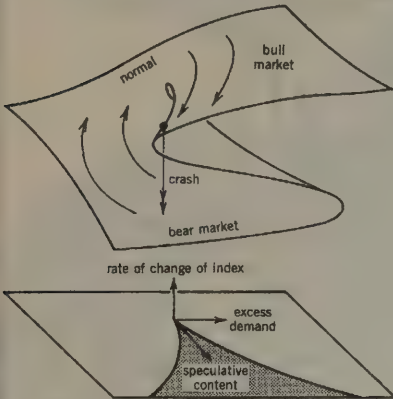
olved. Zometool's sturdy components are also useful to chemists, crystallographers, and architects. The hefty price may deter casual experimenters, but complex plastic molds don't come cheap (\$250,000) and there's not a huge market for this sort of thing. On the other hand, there's nothing else like it; I'm saving up to get the big kit. The

4-D Star — This is a 3-dimensional shadow, or projection of the stellated hyperdodecahedron. Just as the edges of a regular pentagon can be extended to form a five pointed star, the faces of the dodecahedron can be extended to form the star polyhedron, and the dodecahedral cells of the hyperdodecahedron can be extended to form the 4-dimensional star. Although it existed in the imagination of advanced geometers, before the Zometool, a model of this object had never been built.



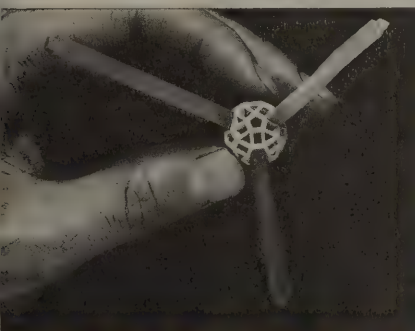
organisms, and the degree to which that process, whatever it may be, is homologous to the flow of human affairs.

■ We conclude with the admonition that the only rule in the Reality Game is to avoid falling into that most common of all human delusions, the delusion of a single reality — our own! —*The Frontier*



Christopher Zeeman suggested the cusp geometry to model the "boom-and-bust" behavior of speculative markets. —*The Fundamentals*

thirty-one-zone geometry was developed by (and this kit is licensed by) longtime WER contributor Steve Baer, otherwise famed for innovative, excellent solar equipment and acid wit. —J. Baldwin



Zometool Components — Parts are shape-coded so they always fit together, no matter what direction construction takes. There is a mathematical relationship between the shape of the strut, its length, and its vector in space.

Zometool

Whole kit (#ZT1): \$675 postpaid

Half kit (#ZT2): \$375 postpaid

BioCrystal Inc., P. O. Box 7053, Boulder, CO 80302-7053; 303/786-9888

Design Methods

Thirty-five major design strategies are thoroughly discussed in this unsurpassed, twenty-two-year-old book. The 1992 second edition has some adjustments and additions. It remains the same difficult but rewarding read, and is still ahead of the game. The book is especially strong on collaborative design involving complex requirements.

—J. Baldwin

■ The stating of objectives is undoubtedly one of the most important and difficult parts of designing. Hall (1962) points out that anyone who says 'I have just determined the best objectives for this project' is simply mistaken. It is impossible to prove that objectives are correct before a system has had its intended, and unintended, effects upon the situation as-a-whole. This is because the future value of an action depends upon human opinions which cannot be foretold because they are only partially governed by the action itself; they are largely governed by the responses of persons concerned.



Design Methods

John Chris Jones, 1992; 461 pp.

\$39.95 postpaid from Van Nostrand Reinhold/Order Dept., 7625 Empire Drive, Florence, KY 41042; 800/842-3636

■ The research that is needed to produce a network of objectives and sub-objectives may take a lot more time and money than do the letters and meetings which are usually thought to be sufficient to begin a large project. The extra effort of mapping objectives is, however, negligible in relation to the penalty that it is intended to avoid: the abandoning of a costly project because the objectives have been misunderstood or because the objectives are incompatible with the available resources.

Invention

Norbert Wiener (1894-1964) helped to build and inform our high-tech society. A mathematician with dirty hands, he moved easily between theory, invention and engineering. His famous book, *Cybernetics*, and its lay version, *The Human Use of Human Beings*, are still influential. (I count the latter as one that sharpened the focus of my life.) The manuscript of this unpublished 1954 book was found long after Wiener's death, and is only now available. It's inevitably out of date here and there, but the uncannily accurate predictions and warnings at its heart bring credibility to advice and insights that are all too relevant to our present situation.

—J. Baldwin

■ Russia may be our chief antagonist or potential antagonist for many years, perhaps even for more than the forty of which President Eisenhower speaks. However, our long-time chief antagonist will not be Russia, but is to be sought for among the continuing threats of hunger, thirst, ignorance, overpopulation, and perhaps the new dangers of the poisoning of the world in which we live by the radioactive by-products of an atomic age. Thus we must go into training for a marathon race and not a sprint. We cannot win in this marathon race unless we have that sense of the future which is based on a sense of history.

Invention

(The Care and Feeding of Ideas)

Norbert Wiener, 1993; 154 pp.

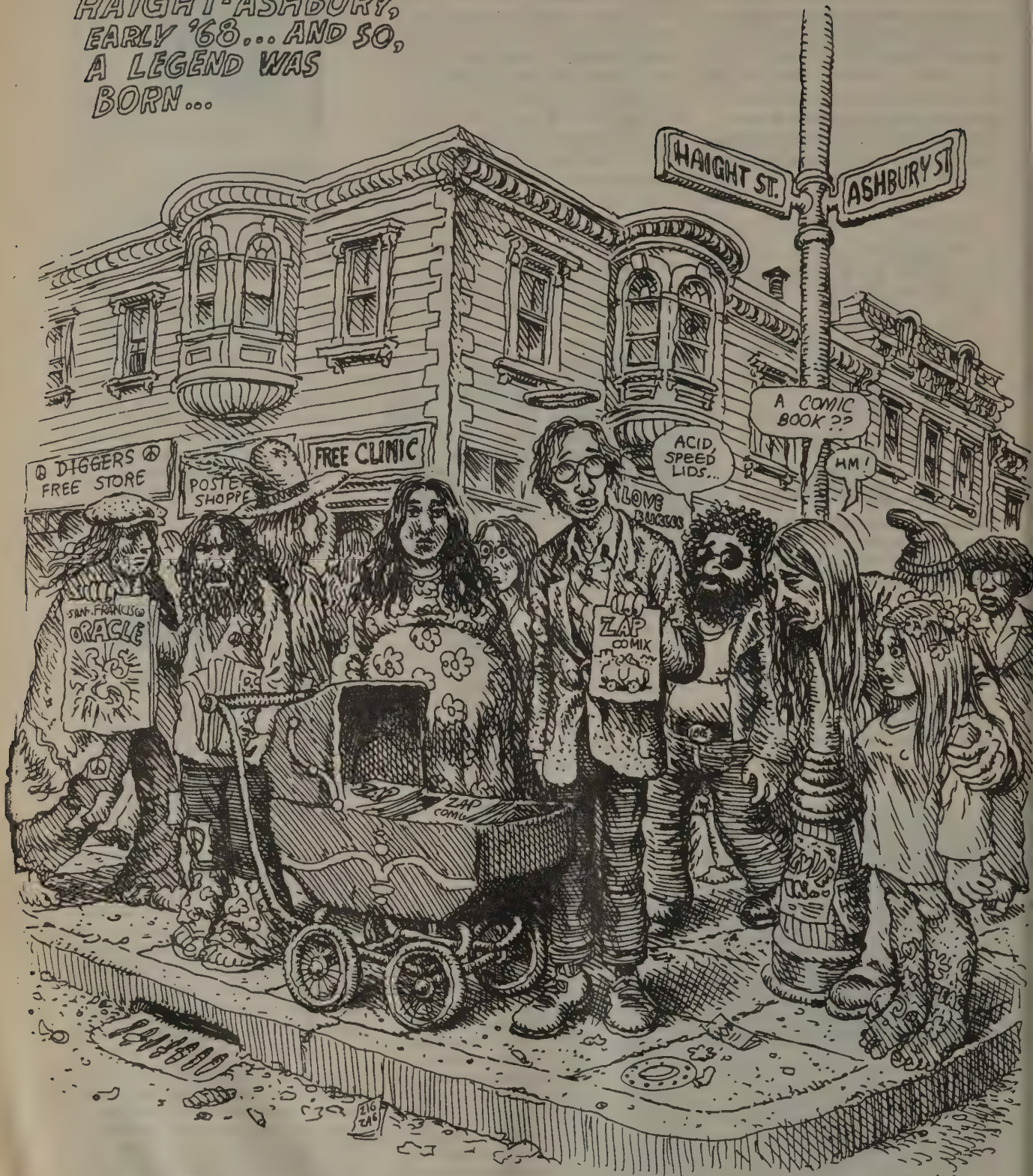
\$19.95 (\$22.95 postpaid) from The MIT Press/Order Dept., 55 Hayward Street, Cambridge, MA 02142; 800/356-0343

■ Some secrets will get into the hands of the enemy, and a policy which altogether ignores this expectation is not realistic and not conducive to our own safety. We must expect of secrecy only what secrecy can reasonably perform. Even more than this, as far as this secrecy itself goes, we must determine its degree on the basis of an objective consideration of both its advantages and its disadvantages.

● After a certain question has been asked and answered, it will generally be found that the answer, if satisfactory at all, fits it not like a bathing suit, but like a loose robe; that is, a new method involves so much invention that it is scarcely likely that its value will be confined to the questions already asked. Under these circumstances, every scientist must occasionally turn around and ask not merely, "How can I solve this problem?" but, "Now that I have come to a result, what problems have I solved?"



HAIGHT-ASHBURY,
EARLY '68... AND SO,
A LEGEND WAS
BORN...



OCT. '92

R Crumb's Sketch Book

1992

M. Marceau
ONE OF THE GREAT
FRENCH ACCORDEON
PLAYERS... WHY DID
HE NEVER SMILE?



1968 was the year of the first Whole Earth Catalog and the first Zap Comix, by youthful cartoonist Robert Crumb. Here it is twenty-five years later and we're both still doing the same thing. How embarrassing.

Crumb now lives in a village in the south of France with his wife Aline and thirteen-year-old daughter Sophie, three existential artists ricocheting off themselves, each other, and the layers of culture around them. —SB



WE'RE LOST!



"MY HORSES AIN'T HUNGRY" —OLD SONG



JAPANESE YOUTHS INTO OLD-TIME AMERICAN HILL BILLY MUSIC

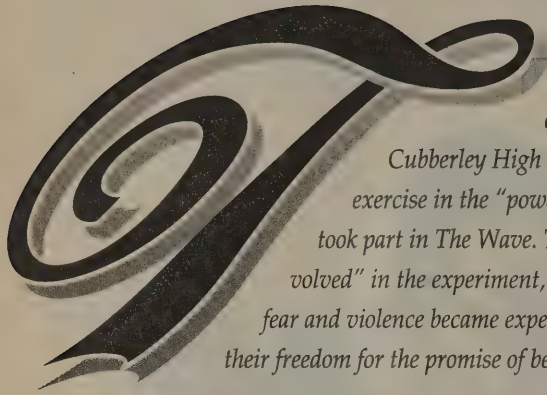
"YES, OLD-TIME
MUSIC IS OUR
LIFE-STYLE..!"*



* REAL QUOTE

BASED ON A TRUE STORY

BY RON JONES



THE THIRD WAVE was a classroom experiment on the workings and consequences of Fascism. It took place in 1967 in my World History Class at Cubberley High School in Palo Alto, California. The experiment that was initiated as a one-day exercise in the "power of discipline" became a five-day nightmare. Over 300 students eventually took part in *The Wave*. The desire to be "a part of the group," to be "successful" and "actively involved" in the experiment, replaced student curiosity and expression. Uniform behavior, salutes, tattling, fear and violence became expected conduct. The experiment climaxed in a rally in which students gave up their freedom for the promise of being superior to their classmates.

The first public account of *The Third Wave* appeared in *CoEvolution Quarterly* (Spring 1976). The story didn't end there. *The Wave* has become a Russian nesting doll, with each colorful face giving new evidence about the enigma called Fascism. It has become a television drama, the source of countless news articles, an international bestseller, and a theatrical performance in nine countries and as many languages. And, perhaps most intriguing of all, the reason for the German government to invite me to Nuremberg to address rallies concerned about neofascism. *The Wave* has become a true story based on a true story, based on a . . . This is part of that story.

1

Dozens of articles in *Whole Earth Review* and *CoEvolution Quarterly* have turned into books, but probably no single article we've printed has had the lasting impact of an eight-page story titled "Take As Directed" which we ran in Spring 1976. It was the tale, confession really, of a teacher who was too successful. Ron Jones had innocently invited his high school students to re-enact history, to try on the discipline of Nazi-style obedience and melodrama with a made-up movement called *The Third Wave*. To his horror, the students loved it. The experiment went out of control and began taking over the school. Teacher Jones tricked the students into attending a big rally, supposedly to connect them to a national movement. Instead he gave them a fierce dose of the reality of what happened in Nazi Germany. *The Third Wave* evaporated in shame and silence.

Then he told the story in *CoEvolution Quarterly*, and a whole new series of repercussions was set in motion (beginning with the attempted theft of the story by a famous Hollywood liberal). All over the world now, young people on stages are giving each other the *Third Wave* salute and thinking about how good it feels. —SB

FOLLOWING THE PUBLICATION of "Take As Directed" in *CoEvolution Quarterly*, I was contacted by film, TV, and a host of dreamers and schemers. I sold the media rights to Norman Lear. Following a day-long discussion about teaching and philosophy, Mr. Lear chuckled to his co-producers, "He's an anarchist!" One co-producer actually asked, "What's an anarchist?" The others just grimaced. "How can we make a story about an anarchist?" It should have been a warning. But I was too busy with my Movie-of-the-Week smile!

I had self-published "The Wave" in an uncopyrighted collection of stories that I mailed to friends. On the basis of this, Norman Lear's lawyers were quite willing to consider *The Wave* public property and simply steal it. But fortunately for me, *The Wave* was protected by *CQ's* copyright. I suspect Stewart knew it was a Maltese Falcon of sorts: better to give it back than worry about a fat man.

Two years later, I received a postcard telling me the movie was complete and a preview for net-



CoEvolution Quarterly #9

work executives was scheduled for that afternoon! I grabbed my daughter Hilary and sped to the airport. We sat in the back of the projection room as the producers informed the assembled executives that this was a show prepared as an "After-School Special." The film flickered to life. I immediately understood why they hadn't wanted me to be a part of it. The teleplay revolved around a love affair between two students. Of course this love gave the students the awareness and confidence to halt the experiment. I turned to my eight-year-old daughter: "It didn't happen that way!" I needed to explain to someone the historical error in the film. "Love didn't stop The Wave and it sure didn't stop the Holocaust!" Hilary brought my disappointment into perspective: "Could we see some stars now?"

The film was an instant hit. The executives walked in tight circles and talked on their phones. The producer, Fern Field, smiled and confided in me, "It's going Prime Time!" The Wave won Emmy, Peabody and Golden Globe awards. A novelization of the teleplay was rushed into production by Doubleday/Dell. It perpetuated the same misinformation as had the TV drama. In the film and "tie-in novel" there was no mention of the subtle changes in power and identity that mark one's experience with Fascism. The erosion

"I slowly raised my hand and saluted. Without command the students returned the salute.

"Throughout the next few days students in the class would exchange this greeting. You would be walking down the hall when three classmates would turn your way, each flashing a quick salute."

— from "Take As Directed."

of humor and the absence of rebellion. The denials of those who claimed they were "simply going along" with the experiment. Author Todd Strassner (writing as Morton Rhue) did not interview any of the individuals that took part in the experiment. Or report on what the students and I did after The Wave, when faced with the real racism of school integration and the Vietnam War. The truth simply didn't matter. History wasn't important. There wasn't time for it. The nation gobbled up the novelization, and the press releases that summarized The Wave in one or two hyper sentences: "California High School Turns Fascist."

The Wave is not something I'm particularly proud of, but it became an opportunity to examine our willingness to give up our freedom. With this in mind I nervously accepted several requests to go on national television. Donahue introduced me as a Communist.

There were surprise visits from television crews from Germany, Israel, several evangelical networks and independent filmmakers. I was always asked to stand next to or ride a cable car while explaining The Wave. A German crew asked me to provide directions to their real interest in traveling to the US — Las Vegas! I have never seen any

of these productions. It's strange to get letters from European students asking about *The Wave* and its connection with Las Vegas.

Worldwide, 236 magazines, religious periodicals, and newspapers have reprinted parts of the novelization or exaggerated press packages released by ABC-TV and Doubleday/Dell. Forty-one psychological and educational textbooks have printed various versions of *The Wave*. (Most news and magazine articles and even textbook accounts are taken directly from press releases.) The most frightening request about *The Wave* came from Jim Jones of People's Temple. He was convinced I knew some secret way to control people, and was enraged when I refused to meet with him.

The novelized version of *The Wave* continues to be an international bestseller. Of course, to sell books the publishers always subtitle the book as "based on a true story." They never mention that they don't print the truth. Today the novel is published in German by Ravensberger; in English by Bantam/Doubleday/Dell and Penguin; in Hebrew by Am Oved; in Danish by Forget Mols. *Die Welle* is required reading in German schools and has sold over a million copies.

Columbia Pictures purchased the rights from Norman Lear, and refused requests by small non-profit or state-owned European theater companies to produce *The Wave*. After listening to playwrights who were continually ignored by Columbia, I looked into the matter. Columbia ignored me as well. After a dozen or so unanswered calls and letters, I filed suit for royalties from the international sales of the novelization. (Until 1989 I had not received a penny in royalties and in fact thought none were due.) It turned out Columbia owed me a lot of money. I took the settlement and, more importantly, the rights to *The Wave* as a play.

With the theater rights in my possession I could accommodate the church, or school, or state theater group desiring to write and produce "their" version of *The Wave*. This has unleashed hundreds of productions in Germany, Israel, Turkey, Belgium, Russia, France, Denmark, and throughout Eastern Europe. If the novelization and TV presentations of *The Wave* were abortions of the original event, the plays have been penetrating explorations into Fascism and human behavior. It's wonderful to get footprints of the play performed as a rock opera or Gregorian chant, classical three-act drama, or scored as a musical or recited in bebop, under the stars in Roman ruins, in theaters, libraries, attics, and auditoriums.

2

If the novelization and TV presentations of *The Wave* were abortions of the original event, the plays have been penetrating explorations into Fascism and human behavior.

PLAYWRIGHT REINHOLD TRITT'S Düsseldorf theater company, Junge Ensemble, has toured Germany several times with their production of *Die Welle*. Tritt's production won the 1990 Play of the Year Award in Germany. Visiting German schools with Reinhold, I realized the power of *The Wave* as a vehicle for Germans to analyze and express pent-up feelings about Fascism. Students (particularly) could openly discuss Fascism — not as it occurred in Germany, but in a California high school.

For the final performance of 1990, Reinhold's theater company and local schools sponsored thirty Israeli students to visit Düsseldorf and attend the play. It was the first time Israeli students had traveled to Germany since the Olympic terrorist act of 1972. The two women teachers responsible for their safety carried weapons and a quivering fear.

When the play concluded, with an enlarged photo of Adolph Hitler floating above the stage and actors shouting and saluting, a chill crossed my heart. The curtain that customarily signaled the end of the play did not fall. Reinhold asked the performers to come forward and sit facing the audience. I hesitantly joined them.

The audience of several hundred people seemed to be holding its breath. Hitler looked down upon us and smiled. Then sobbing could be heard from the back of the theater. People throughout the theater began to weep. Heads disappeared in protective arms. We were together, with hundreds, yet alone. We were all crying.

Individuals in the audience began to murmur their reactions to the play. To recount memories of the Third Reich. A grandfatherly man stood and addressed the audience. "I was a streetcar conductor and then there were no electric cars, so I was a guard but always I was just a conductor." His confession was met by a woman clutching a large purse. "Shame on you — we should remember Dresden!" "Why don't we just forget about the past?" a student pleaded. Voices began to knit together the fabric of their common experience. Feelings and frustrations overlapped like arcing electric wires. The Jewish students did not speak. Or turn to look into the eyes of the beast behind them.

Friends outside the theater came in to find out what had delayed their companions' exit. Like



Blatte

Rheinhold Tritt's
Junge Ensemble
stages *Die Welle*
in Dusseldorf.

sticks caught in a tornado of opinion, they spun into the hall and clung to the walls. Gaping at the urgent conversation. Realizing that something important was occurring. Like their seated counterparts, they were now a part of the whirlwind.

Finally the room of questioning souls spun itself into exhaustion. After a night of anguish, there was no answer — only people facing a reflection of Hitler. And, before the stage, thirty Jewish students. It became apparent that the audience was waiting for the Jewish youths to comment. Hours had passed since the play had ended and they had confessed; their sins lay exposed at their feet. A single faint question came forth:

"Are we always to live with this silence?"

Alone at the center of the stage, a strapping Jewish student turned to the audience. For a second he stood transfixed beneath Hitler's outstretched hand. His voice was first shrill, then calm:

"You don't understand — we don't want your apology or anything from you! You have your Turks, we our Palestinians. You don't understand — *we've become good Germans!*"

Awareness charged through the audience. They were looking at a past and a future where personal identity becomes one with racial identity. A world in which violence in defense of racial purity becomes tolerable. And then acceptable. And finally the rule of survival. The smile on the child's face and on that of the prince behind him were identical.

IN 1992, I WAS INVITED back to Germany by several municipal governments to discuss the implications of *The Wave* for German youth. I attended meetings in Swabach, Erlangen, Frankfurt, and Nuremberg. In each situation I was greeted like a hero. Or like a mystery person that everyone had read about. I'm sure they were curious if I might resemble Hitler in some way. After all, we had both created movements that had gotten out of control. And perhaps there was some secret they might glean from my presence to explain the past.

I was uncomfortable being treated like a master. In truth I am for most of my life a gym teacher and happy grandfather. I grew up in a working-class family with lots of love and support. My Jewish mother believes it's her duty to put new curtains on the world and make it a better place for everyone. My Catholic father thinks everything is perfect if he can play his trombone for a fading sunset or a child's birthday. From my family I learned hard work, fairness, and kindness. Oh, I have a Machiavellian streak, and a stubbornness, but what usually wins out in my personal decisions is faith that people will treat each other fairly, with dignity and compassion. I do not believe in original sin and its consequences — that we live in perpetual chaos, waiting for salvation



In January 1993, *Die Welle* premiered in what had been East Berlin.

from some law-and-order dictator or born-again corporation. Survival of the fittest has more to do with love and cooperation than with the length of your teeth. Images of the "good consumer life through free exploitation" do not sustain me; freedom to tell about and challenge oppression excites me.

These ideals, however, do not translate to my hands. I mostly feel alone on a treadmill that keeps me from acting to effect change. Everything seems overwhelming. Excuses for inaction throb in my head; memories of losing my teaching job for protesting racism, and risking my life to defend Black Panthers, shout caution and then silence.¹ It's easier to turn on the television than to face the poverty and the racial wars outside my window. So I have become not like my mother, who fights inequity on a hundred fronts, but like my father, who is content and at peace with the songs in his head. And like most around me I prefer to ignore and avoid the realities of racism — past and present.

But in Germany I was not allowed to forget. It was as if the earth yawned and the escaping dust from the past filled my being. German audiences of young and old crammed auditoriums to hear what I would say about *The Wave* and racism. I was a human lightning rod. Forced once again to take part in history. To speak for freedom. To once again be a teacher.

IT IS SUNDAY, October 11, 1992. The first freeze of winter has touched the plants and they have

shriveled. My mind drifts with the motion of the automobile. Swastikas crawl like spider monkeys down blood-red banners. Hands reach out. Faces smile as the limousine carrying Adolph Hitler carves through the sea of waving hands. Like a snake the procession moves through the crowded streets toward the Rally at Nuremberg. I've seen this vision in documentaries and countless newsreels. It is the moment of triumph for the Third Reich.

And now I am on that same journey — I am in a car driving toward a Rally at Nuremberg. I have been brought to this moment by the city officials of Nuremberg to speak to their citizens about the dangers of Fascism. In the distance I see a huge, flat building. The once-proud columns have been shorn off, and the building stands before us like a mammoth coffin. In the bowels of this building we walk up a series of steps into the famous Gold Room.

The Gold Room is a cathedral-size gallery without windows. This hollow space echoes with the clicking of our heels on the marble floor. The gilded ceiling looks down upon us — a universe of sacramental symbols. At the far end of this hall is a small room guarded by a massive copper door. The door leads to Hitler's private chambers. My host whispers, "This is the room, his private room, where Hitler consecrated a Reich that would last a thousand years." This is the room the German officials ask that I speak in!

Bodies crush to make a path to the center of the room. It is dark and I take a moment to adjust. No one speaks a word. Hitler's private chamber is a

¹ In 1969 I was fired from Cubberley High School in Palo Alto for being involved in student protests over racist school policies and the school district's practice of denying students the right to speak and assemble. Following this dismissal, I was never able to get a job teaching in the public schools again. I have self-published a book about this experience, entitled *Airman*.



burned-out hole. The blackened room is dank and the scarred walls perspire. The light from a single fluorescent lamp streaks across the pockmarked ceiling. Shadows crawl up the wall with the slightest movement in the tightly packed room.

I realize why I have been invited to Germany, and particularly to this place. The Gold Room and its antechamber represent the Germans' ultimate dilemma. They do not know whether to venerate Hitler or despise him. Their soul is here in these two rooms, divided and broken, lost in the past. I am here not to lecture about humanitarian good will, or even to explain The Wave. I am here in this room crowded with German citizens to singlehandedly remove, to exorcise, the guilt that is Fascism.

As I look at the assembly before me, I see children. And I am not in some dark place but in a classroom, and I am a teacher again. The image of Eva Mozes comes to my mind — her wish that we tell all the children about the Holocaust, "for they are the messengers we send to a future we will never see."² It's with this vision that I begin to tell her story.

3

IT WAS OCTOBER, 1986. The phone rang: a late-night call. The faint voice in the receiver asked if I was the Mr. Ron Jones that had conducted The Third Wave. When I answered yes, I heard a clatter of English mixed with German. The woman's voice pleaded with me to come to her in Terre Haute. She had sold her home³ to sponsor a conference on Fascism and protest the claim that Joseph Mengele was dead.

"All of the children are invited, Mr. Jones. I am one of the Twins, you have heard of us — children taken to Auschwitz for their medical experiments, to make a master race. You remember the Twins, don't you? My sister will be here, all the

² I borrowed this phrase from a conversation with Dolores Soloy Kohl. I don't know its author but it seems to belong here.

³ Prior to publication of this article, I talked with Eva Mozes. She pointed out that "I didn't sell my house and everything to sponsor the conference! I borrowed \$20,000 against my house."



way from Tel Aviv — I have sent her the tickets, she's afraid of travel, and her health — but for this, she is coming. I have located sixty-seven twins still alive; they are coming to tell the school-children the truth — what Joseph Mengele did to us. Students will listen to you — a teacher — I've printed learning materials for the curriculum and sent them to the schools, 4,000 copies. 128 pages, for the teachers to use in preparation for our conference. You will come, won't you? I've sold everything for this . . ."

A week later I wobbled down the foldout steps of a commuter airplane to be greeted by a little old woman with wandering eyes. Her name was Mozes, Eva Mozes. I knew because she was the only person in the airport reception area waving a real-estate sign with the inscription *MR. JONES — EVA MOZES WELCOMES YOU!* My immediate thought was how old she looked. Of course people of your own age group always look much older. We were both children of World War II.

She looked up at me. "You look a little older than I thought." I grinned. Her eyes smiled in relief. It was my turn to stare, at her wonderful jigsaw face. She answered my look. "It's the eyes, isn't it," she quavered. "The way they move back and forth. They tried to make them blue and, like everything else they tried, it didn't work." She swept one hand from side to side. "Don't let them bother you, I can still see."

On the way to my hotel, Eva turned and looked at me. "This conference — it's going to be for *all* the children, so they won't forget — there's candy bars in the glove compartment." She seemed to be looking through me toward some specter in the fields. Some unseen thing that slid past us in slow motion. A whisper fell delicately from her lips. "*Always so orderly, the instruments are always in the same place, on the same tray — waiting for me —*"

Her thoughts that had escaped the past quickly tried to find the present. She smiled and cautiously explained. "Can you imagine — I'm always trying to understand why it is when I go shopping in the grocery store, the big chain stores, I see — human skulls, always piles of skulls neatly stacked waiting for me, and then I realize I'm looking at a display of oranges, or melons — cut hay does it too, sometimes. Why is it, hay in a field, reminds me of such things?" I didn't have an answer. She whispered, "There are good children here; it's important they don't look up some day and see skulls."

The Red Lion had probably never been so fully booked. Or honored. Eva had reserved every room for her conference guests. The hotel restaurant was closed to the public and set up to provide conference meals and a press center. As she surveyed the tables, Eva seemed pleased.

"I have to make sure no one is left out, everyone

must be welcome, particularly the newspapers, they will come — I've told them you will be here, and the Twins. There are only a few left but most will be here, all together again to tell our story." She counted the tables for the 260 guests. And all the while she dreamed out loud.

"Each person will have a conference packet giving the schedule and events. We'll meet here tomorrow at nine for breakfast, then the press conference at ten, and lunch and then can you imagine — the most important thing we can do — go to the school, the auditorium, all the classes they are invited, I have arranged it with the school officials. There will be 2,500 students, maybe more, it is all arranged."

At the registration desk, the clerk intoned how they had hired extra help for Mrs. Mozes and how much their small city appreciated having someone Jewish living in Terre Haute and having this International Jewish Conference. He looked toward Eva as he spoke to me. "You know, sir, my father's a school counselor here and he's heard all about this meeting of yours. Yes sir, it's going to be some big-time conference. At school they just can't stop talking about it!" He nodded to Eva; too busy to acknowledge the clerk's attention, she was off to the airport.

Disappointed that his comments didn't cause a reaction in Eva, the clerk turned to me. "You're not Jewish, are you? You sure don't look like those others she's got coming in here." Caught a little off guard, I answered, "No, I'm from San Francisco!" His eyes followed me to the elevator. His smirking voice squeezed through the closing wood panels. "She thinks she owns the place!" The door slid shut.

Eva's wake-up message jerked me to my feet and the waiting day. Entering the restaurant, I expected to see a galaxy of press with their antenna microphones and talking pads of paper. I was anxious to meet Eva's sister with the blue eyes and other Twins that Eva had financed to attend the conference.

At first I thought I was just early, as a dozen or so people glanced up at me. Then I realized with shock that Eva's conference was a complete failure. Eva greeted me, tugging me to a table. "Name tags aren't important, I want you to sit here with my sister Miriam, and this is —" She touched the hand or shoulder of each person in apology, assuring us, "I guess it's just too difficult these days to travel, just too far to go and — too difficult to meet and to remember." She spun

Being a survivor is not something to cheer. It is the ultimate pain of being alone. Alone with memories of a family that once sat at a table and celebrated life.

around the table and seemed to regain confidence. "There are more coming, you go ahead and eat — I think Peter Somogyi is coming, he has a successful appliance business in New York . . ." Eva rushed from the restaurant. Fretful faces turned quietly toward half-eaten rolls and eggs.

Like everyone at my table I surveyed the empty room doubtfully. All those tables so perfectly set. All those glasses that would never be lifted in a toast. Being a survivor is not something to cheer. It is the ultimate pain of being alone. Alone with memories of a family that once sat at a table and celebrated life.

Eva made several trips to the airport with her welcome signs, but no one else arrived. The press straggled into the large room and set up their lights. The reporters outnumbered us. There were two local TV crews, a local newspaper reporter, several stringers and a representative sent by Simon Wiesenthal. They all asked questions at once, questions that tore at years of silence. I felt profound sorrow for those sitting next to me.

A few panelists stood and walked out of the spotlight. Others sat mute, or squirmed like children caught doing wrong. A man with a pencil mustache was unconsciously sucking on his shirt sleeve. Eva took the podium and asked that all questions to be directed at her. Once she started talking, there was small opportunity for questions.

"The purpose of this conference is to reject the finding in Brazil that Joseph Mengele is dead. We are representatives of the Twins. It was Joseph Mengele in charge of the death camp Auschwitz-Birkenau who decided who would live and who would die. We watched our families march away and never return." As Eva spoke, the faces near me looked up, surprised that someone would speak for them. "We were Twins, and as such saved by Mengele for his genetic tests, to create a master race. There were 3,000 Twins selected for experimentation; all were children; only one hundred survived. We have waited all this time, embarrassed by our fate and our survival, with feelings of guilt and anger, but most of all afraid to tell anyone — even our loved ones — what happened to us. Afraid even to remind ourselves of what happened." Eva looked at her blue-eyed sister, Miriam. Miriam nodded permission for Eva to continue.

"So now the Angel of Death, the man we called Uncle Mengele and sometimes Father, the man we despise for the terrible things he did — he is reported dead, and there are newspaper stories that

the Holocaust did not happen. That six million Jews did not vanish from this earth in the fire of the crematorium." I thought she would not be able to go on. Then the man with the mustache stood. Miriam stood. Then another Twin. They stood in silent support of the woman who had called them here, the person who had finally given a voice to their oblivion.

"Joseph Mengele, what he did to us, he can — for us, he can never be dead. He is in our thoughts and the faded pictures of our families that we carry with us, he can never be dead — or forgotten." Eva's voice gained in strength and her head tilted upward as if she were addressing the heavens. "So today we stand before you like a flickering candle, a light, a reminder of the darkness, the evil that was the Holocaust." Eva smiled. Not the smile of relief, or victory, or wonder, but of contentment. "This afternoon, we will tell the children of Terre Haute about Joseph Mengele and how racial hatred and prejudice can lead to Fascism, how it starts one step at a time to rob you of your identity and freedom to choose your friends and your destiny. How it pits one group or race or culture against another and roars into a flame in which one's identity is based solely on the uniform or hood or star you wear on your coat. And then the violence you can rend on those declared different, inferior, unnecessary and fit only to die. How this blind violence and hatred leads to a night that can last forever.

"There is a hope that survives in us. A hope for our children. For in our children there is an inherent wish for a better world. A world in which one's identity is not based on a uniform or the humiliation of others, but on the courage to choose your own friends, to live with and respect the differences in others. To even share and celebrate those differences." Eva addressed her final words not to the press, but to the Twins standing behind her. "We have witnessed the giving of life so that someone less fortunate might live. The vulgarity of life in those that only thought of themselves. We have seen nakedness with pride. Beauty where there should only be desolation. Courage before the inferno. The last piece of bread being shared among strangers. Can you imagine such things as we have seen and felt?"

Each Twin was trying to hold back the torrent of memories. They sobbed and fought for composure. In the stillness that followed, they slowly stepped forward to tell their stories.

The mustached man spoke: "There was these twins, not even identical, but they was, um, they

"So now the Angel of Death, the man we called Uncle Mengele and sometimes Father, the man we despise for the terrible things he did — he is reported dead, and there are newspaper stories that the Holocaust did not happen. That six million Jews did not vanish from this earth in the fire of the crematorium."

was — they was sewn together like dolls facing each other to see, ah, if they could live and be like Siamese twins, attached here — " His hand traced a line from stomach to groin.

Another witness took his place. "I have never spoken of this, not even to my husband or my children." She hesitated. Her fingers pulled at her Marilyn Monroe wig. She looked like a child trapped in a blond cloud. Her words seemed to surprise and frighten her. "Nothing happened, I tell you, nothing happened!" The man with the mustache spoke as if in a trance, completing a thought he had started minutes ago: "They were the lucky ones!"

Eva moved to the podium, to hold her friend with the tilting wig and comfort the mustached man, who was beginning to sob into open hands. With one arm around her slight companion, she spoke with elegance.

"As Mengele's Twins, we were given special treatment — allowed to keep our hair and our clothes and even to move around the camp. We picked flowers outside the gate and were paraded around the camp; can you imagine carrying these flowers? And the women in the labor barracks would yell to us the names of their children. Wherever we went, there was this calling of names, mothers desperate to know the fate of their children, there was always day and night this screaming of names. Our barracks were next to the crematorium. The windows were too high to see out but we could hear in the night the passing of footsteps, children crying for their parents, parents waiting for their children. It never stopped. And when *we* went to have children — "

The two women shuddered in the white light, shuddered in a common chill. Both women seemed old and frail, yet somehow victorious. Eva continued: "When we had our children — I was afraid my baby would be a monster, like the children I had seen mutilated, children next to me, other twins given lethal germs that shriveled the body or caused great sores that would not close. The diseases I might carry from similar injections, the rumor that all the Jewish girls had been inseminated with animal sperm. So: when my baby was born and she was healthy, I cried, not because I was happy but because even then I was sad and angry.

"I have no mother to come and fuss over me. No mother to show my healthy child to. You must realize we have no one but our children. Our families are gone, our parents, brothers and sisters, our uncles, all gone. Everything is gone, taken away

from us — even hope for the future sometimes leaves us. It is hard to explain. We are like actresses. On the outside we are laughing and smiling and talking to you. But inside everything is rotten and dark, and will remain so until the end of our lives."

Other members of the conference slowly took their places next to Eva.

"My mother thrust into my hand a toothbrush and toothpaste, that's all I remember; she was told to go to the left side, toward this building that seemed on fire — "

"Two children on the train, in the car with us for so many days without food or water. And they were crying, all the way crying, they wouldn't stop crying. Their mother choked them to death because she could not stand to watch them suffer. But, you know something, I was glad the crying finally stopped."

"I had this nail on my platform sticking out and at night I'd stick myself, make myself bleed, 'cause I wanted to be like the doctors."

"Two dwarves, twins like us, and the guards made them dance naked in front of Mengele. Standing naked the guards always laughed at us . . ."

"I remember this small gypsy boy all dressed in white and kept on a leash like a dog."

"Sonderkommandos, the young boys who worked inside the gas chambers, every day they'd give us reports: 10,000 burned today, 8,000 yesterday, *you'll be next!* They kept telling me: *you'll be next!*"

Eva stopped the bleeding by directing the press to the next item on her agenda. "So today at three o'clock we are going to the high school here, and we will be telling students our stories, and Mr. Jones he will be telling students about what happened in his classroom, it's an important lesson for the children to hear. Can you imagine, we will be talking to over two thousand children here in Terre Haute and we hope you will report this on your television and in your newspapers . . ." As Eva spoke, the reporters filtered out of the room. Eva was explaining how she had personally financed the conference and how she expected many late arrivals as the last reporter left the room. The man with the mustache muttered, "They don't really want to know, don't really care."

For a moment Eva was silent. And then she was once again cajoling, pushing, insisting that we proceed to the high school. "The teachers will

care, the students will care, they will be waiting for us." Her faith was unmovable. "They will listen to us and know they have a choice in life, not to hate, they will know the importance of resisting racism and its lies . . ." With Eva leading the way we marched to the school auditorium.

Our destination was the final insult. The auditorium was empty. We huddled in a circle at the foot of the stage — looking, waiting, for Eva to tell us to just go home. Then the rear doors of the auditorium opened.

Sunlight gleamed behind the entering figures. Eva crowed, "The students are here, the children have arrived, we can begin. I told you they'd be here!" But the people entering the auditorium were only school officials. They stopped at the rim of the auditorium. With them was the grinning clerk from the hotel. The grayest of men spoke first.

"I'm sorry to tell you that the assembly has been canceled; the teaching staff felt — "

"Canceled? The teachers — I sent them all the materials — "

The principal was accustomed to having the last word. "This material, this idea of yours for a conference, well, it's just too one-sided — "

"Who do you wish we should bring with us — Dr. Mengele? Is that who you wish to address our children?"

"Mrs. Mozes," the principal stammered, "I told you we would have to have a committee of English teachers evaluate your material, and we concluded it's just too violent; we don't want our children frightened."

"Frightened?" Eva exploded and ran up the aisle toward the startled men. She screamed, "What's frightening is you, and what you have done!" Before they could answer Eva Mozes was pummeling them with windmilling fists. They scattered and dashed out the door to safety.

Eva had hold of the principal. "Where are my children?" she yelled. "Let go of me, you Jew!" he yelled and pulled free. The hotel clerk screamed, from a safe distance, "Go back to where you belong!" Eva chased all of them through the double door and into the school hallway. An alligator loafer was lost in the retreat. Eva's voice could be heard down the hallway. "Come back here! *Du bist feige!* What are you afraid of? *Shmucks!*"

Not one of us in the orchestra pit even moved. We stared in amazement at Eva's conviction. Her ability to spring into action. To show these educators for what they were — cowards at best, racists by

"This afternoon, we will tell the children of Terre Haute about Joseph Mengele and how racial hatred and prejudice can lead to Fascism, how it starts one step at a time to rob you of your identity and freedom to choose your friends and your destiny."

choice. Men without conscience or conviction. Men that would have made good Nazis.

Eva majestically returned to the auditorium with two students. One carried the lost loafer. "Don't worry." Eva soothed, "I've just asked these students to join us." One of the students, a big redhead, joked, "She didn't exactly ask!" Eva explained, "I told them this would be the most important event of their life." The girl smiled. "She said she'd break our necks!" "Did I say that?" Eva asked innocently as she held up the alligator loafer like a trophy. "I said, I should break their necks for keeping children from this meeting, and throwing away all the books — 4,000 copies, 128 pages — they just threw them away!"

"Freddie and I — my name's Mary Beth Walker — we were just at my locker standing there when the principal ran past. He looked kinda scared. And then when I was getting out my books she came and grabbed us, sorta."

The presence of the two children filled everyone with purpose. Even Eva seemed content. "The students are here; it's time we started."

I was first to speak. Placing my notes on a music stand, I saw a swastika carved into the wood. I draped my coat over this contemptuous message and knew I could not remove it until Eva was far from its sting. I told the story of The Wave. The Twins recounted their stories of heroism and survival. Finally the conference was finished. We could go home. Or could we?

We had all buried ourselves in the worlds of Terre Haute, Joseph Mengele and the Third Reich. It was Mary Beth Walker who gave us a reprieve: she asked, "Are all Germans guilty?" I expected an immediate yes from Eva. I was wrong. "Oh, no," Eva responded, "everyone has a choice."

Mary Beth wouldn't let Eva conclude the conference without explaining. "We know this Dr. Mengele and the Nazis for what they did. But did any Germans resist?" Eva studied her fellow Twins and confided, "I knew of one." As if compelled by her words we all sat down and waited for Eva to tell us of this other German.

"I don't know his name," Eva whispered, "But in a strange way, perhaps he is the reason for this conference." "Was he a guard or something?" Freddie asked. "No, no, he was a soldier like Mengele with a uniform and medals, he was wearing lots of medals. He came on the train, one of the last trains. When the doors opened there he was standing with all these Jewish children crowded in the cattle car behind him. And

"You cannot wait until you stand before the furnace to question even the smallest act of hatred, the smallest infringement of your freedom."

the German guards and their barking dogs, they didn't know what to do. Can you imagine Mengele's surprise at seeing this German officer with all those Jewish children? Seems he was a teacher like you, Mr. Jones; when the authorities came to his school, he refused to let the children leave without him — he insisted on not leaving his students — so they threw him in the cattle car with all the others. There were over a hundred children that they took from the train. But unlike all the others, his students lined themselves up; shortest to tallest, boys in one line, girls in the other. And they refused to move until their teacher gave the order.

"The guards were confounded; this teacher in the uniform of a World War I German major demanded that the guards leave his children alone. That they be given proper accommodations and a schoolroom to continue their studies.

"Mengele was called to the train. He seemed stunned to see a mirror image of himself. A handsome although older German officer with all the elan and presence of a Reich officer. The two men stared at each other; finally Mengele introduced himself and requested that any twins in the contingent be assigned to his special care. The teacher refused. All his students must stay together; the children were orphans, and the school was their only family.

"Mengele finally ordered the teacher to step aside. The teacher refused. Mengele told the teacher that all would be taken care of; the students would be given schooling and proper care. Still the teacher refused to leave his students. Mengele asked the teacher to step aside so they could speak in confidence as German officers.

"Mengele pointed to the tall brick smokestacks. 'You do not really want to stay with these Jews. What do they mean to you? They are going to their God tonight up that chimney.'

"The German teacher looked back at his students. And commanded them toward the crematorium. He was the first to enter the building. His children were quick to follow.

"So: the choice before you and every citizen is not to hate, but to love your fellow human beings. And to fight for your freedom any way you can. You cannot wait until you stand before the furnace to question even the smallest act of hatred, the smallest infringement of your freedom. You, my children, are the most precious possession we have. We will never leave you. Never again."

The children came forward. They came from their



The Gold Room.
Zeppelintribune, Nuremberg.
Designed by Albert Speer.

hiding places. From behind the great furnaces. From the soil itself. They came from their places in the classroom and from their darkest nightmares. A child swinging a toothbrush and another sucking on his shirtsleeve. A sister with blue eyes. They came forward singing rhymes and jumping rope. Hand in hand they came from their hiding places. And like the two children from Terre Haute, they hugged this little old woman with the wandering eyes. This woman named Eva Mozes.

AS I FINISH the story of Eva Mozes, hollow masks stare at me and ask for a definition of the future. The children of the Third Reich and the survivors of the Holocaust are stuck in time. They cannot escape the horror of the inferno. They are doomed to repeat its every moment over and over again. The victim and the perpetrator of hate are welded together in their timeless grief. One has lost a life. The other a soul. So they have asked this teacher into their midst to free them of their nightmare.

But I have no answers. I, too, come from a racist society where hatred and fear are an intersection away. From a place without much history or experience with freedom. From a people perceived by others as "wild" and "childlike." Ignorant of geography and language. Blithely accepting of the franchised marketplace and the demise of the family farm. Content to consume and exploit. So what can I tell the past that seeks me out? What can I tell myself and my children about the future? I have no religion to hold on to. I am the first generation in my family history not to be a rabbi

But I have no answers. I, too, come from a racist society where hatred and fear are an intersection away.

or priest. For me, life cannot be planned, expected, or even explained — only appreciated!

As the faces surround me and the hands reach out to touch my face, I retreat to a personal vision. It doesn't take money or power to be kind to a stranger, stand by a loved one, or fight injustice. It's not the big things in life that make up our history, but the small events — the everyday decisions that give meaning to our future. They are not easy, these acts of courage and sacrifice, but the alternative is to close our eyes and scream. Or worse — to follow someone else's millennium dream. To accept someone else's definition of how we should behave and act. Whom we can befriend. What we should covet and pursue. How we spend our time and direct the course of our souls.

We are free, each and every one of us, to determine our own history. To take responsibility for our life and the well-being of those around us. It can be a story full of fear, doubt, maybe hate. Or a story of friendship and grace. Courage. And love.

So here in the Gold Room I think not of momentous events but of my grandchild. And as I write these words she toddles once again into my presence. Then crawls into my lap. I place my cheek against her lips. She calls me "Pep Pe" and I smile. For in this moment I am doing all I can for a future I will never see. 🐣

For more information about the Twins and the Holocaust, I suggest Children of the Flames by Lucette Matalon Lagnado and Sheila Cohn Dekel (1991); \$14 postpaid from Penguin USA/Cash Sales, 120 Woodbine Street, Bergenfield, NJ 07621; 800/253-6476).

A Taste of Power • This Side of Glory

The Black Panthers were riveting in the late sixties when they brought armed militancy to civil rights, and they are riveting in a far different way in these revelatory memoirs by two leaders of the movement. Here, in vivid close-up, you watch how charisma can move mountains and how it can devour itself and destroy its own cause. Huey Newton, the founder, was beautiful and dangerous and inspiring. (I was moved by him and by the Party's community service activities to invite the Black Panthers to guest-edit the Fall 1974 *CoEvolution Quarterly*, which they did. By that time Huey was hiding in Cuba, and Elaine Brown was running the Panthers effectively and non-charismatically. It didn't last. Huey came back.)

Elaine Brown and David Hilliard handed their lives to Huey Newton and the righteous cause of Black Power. Hilliard became number-two man in the Party; Brown became Huey's lover and later substitute head of the Party. When Huey and the Party leadership turned vicious (with FBI help), their lives were broken. These two books are the hard truth-telling of self-healing by strong creative people. Elaine Brown's account has the rare value of female perspective; Hilliard knows more of the early story and is an even better writer, to my ear. The convergence of their accounts is fascinating to compare and is persuasive in combination. The tragedy is certain: charisma unchecked goes violent.

In case anyone thinks this is a matter of race, study Barbara Branden's *The Passion of Ayn Rand* (Doubleday, 1986), where the whitebread followers of novelist-philosopher Ayn Rand fall into the same melodramatic conflict and self-destruction. —SB

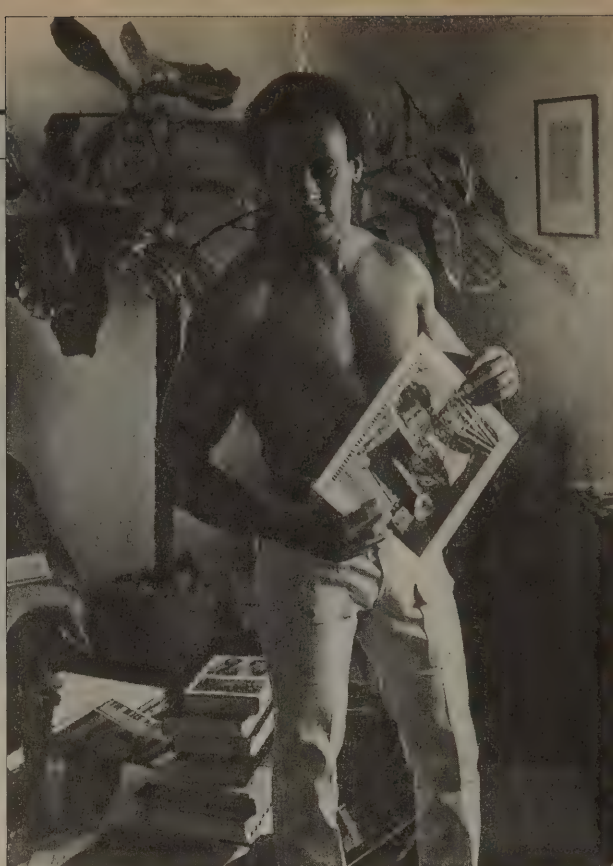
■ "We're gonna organize the brothers," Huey says. "All these other organizations deal with students or the churches. We're gonna get the brothers and sisters off the block like you and me. Like Malcolm would have done."

I nod my head — what Huey says makes sense — and ask, "To do what?"

"Get power," Huey says. "True power is the ability to define a phenomenon and make it act in a desired manner. That's what none of the brothers have. None of us have it. And we have to band together to create it. . . ."

"We call ourselves the Black Panther Party for Self-Defense," Huey says. He explains that the name originates from Lowndes

Huey Newton, founder and leader of the Black Panther Party. —A Taste of Power



County, Alabama, where Student Non-violent Coordinating Committee (SNCC) organizers formed the first all-black party. "The nature of the panther is that he never attacks," explains Huey. "But if anyone attacks him or backs him into a corner, the panther comes up to wipe that aggressor or that attacker out, absolutely, resolutely, wholly, thoroughly, and completely." He tells me about the police patrols. Under California law a citizen can carry a loaded gun as long as the weapon is not concealed. Taking advantage of the law, the Panthers have been driving around armed with their guns and a law book. When they see an incident occurring between a cop and a brother they stop and make sure the officer follows the law. The cops have been totally furious and scared at the sight of blacks with guns, but so far the police have always backed down and there have been no shots fired.

Bobby straps on his over-the-shoulder holster, sets his beret at a perfect angle. Huey slings the bandolier over his chest and picks up his shotgun. Until this moment I've imagined Huey was talking abstractly — as though all this would happen someday in the future. Not now. Certainly not today.

"Where you going?" I ask them.

"On patrol," Huey says, getting into the car.

■ [B]efore them all stands Eldridge, black pants, turtleneck, leather coat, beret, commanding, a convicted, self-confessed rapist! "I'm going to liberate you," he starts. "I'm

going to lead you in a chant."

I'm standing there, listening, not knowing any more than the nuns what's going to come next.

"Okay," Eldridge starts, reminding me of Ras the Exhorter in *Invisible Man*. "Now here's the first stanza. I'll say it and you repeat it: Fuck Ronald Reagan."

I'm maybe even more shocked than the nuns. But one or two of them actually echo his words. I can hear them in the auditorium: "Fuck Ronald Reagan."

Now Eldridge gets into it, urging them on: "Fuck Ronald Reagan! Fuck Ronald Reagan!"

And the nuns are revving themselves up too: "Fuck Ronald Reagan! Fuck Ronald Reagan!"

The scene's an exorcism. Eldridge has proven himself true. The nuns are free; they are laughing and clapping and repeating the chant, all because of Eldridge.

"Now," he says after they burst into spontaneous applause, "you're liberated in speech. You've freed yourself from your fathers because you were imprisoned in the speech of your fathers because the sins of the father are visited on the children. And now you're free of that. You're free with your speech."

When I relate the scene to Huey, I can't help exclaim over Eldridge's genius.

"He's Ali Baba," I say.

"Eldridge is the master of the word," Huey

agrees. "But I'm the master of the gun."
—*This Side of Glory*

I saw only the man who had greeted me at the airport, the man who created Survival Programs and intercommunalism. I refused to see the man who extracted heavy prices for minor frailties and infractions. I did not acknowledge his more and more frequent orders to violently discipline comrades and others, or the discipline he personally inflicted. I had not even looked at the way he had brutally put down the Eldridge faction. I was happy that he had driven the hard men to their knees, for his intuitive ability to develop ideas for change, change for the better, would have been otherwise crushed for all time.

It was by its own desire that the Central Committee had become a euphemism, a body of men with titles but no power. If there were no more Central Committee decisions, it was because they had begged Huey to lead them, guide them, take charge

of their party and their lives, the way men always do with their gods. Their surrender of will had, paradoxically, generated his own surrender to the isolation of absolute leader.

Huey turned to Bobby again. "Bobby Seale, you have violated the trust of this party. You have failed to defend this party in word and deed. The party will discipline you."

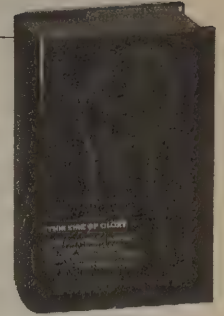
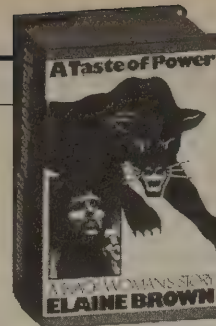
Bob returned with a large black bullwhip.

"Take off your shirt and stand against that wall, Bobby. Do you accept the discipline of this party?"

"Yes, Huey. You know I love you, man," Bobby said, so terribly pathetically, unbuttoning his shirt.

"You should have told that to your cousin."

Freedom. That was all I could feel in those first seconds away from the Black Panther Party. —*A Taste of Power*



A Taste of Power (A Black Woman's Story)

Elaine Brown.

Pantheon Books, 1993; 452 pp.

\$25 (\$27 postpaid) from Random House/
Order Dept., 400 Hahn Road, Westminister,
MD 21157; 800/733-3000

This Side of Glory

(The Autobiography of David Hilliard
and the Story of the Black Panther Party)

David Hilliard and Lewis Cole, 1993; 450 pp.

\$24.95 (\$27.45 postpaid) from Little,
Brown & Co./Order Dept., 200 West
Street, Waltham, MA 02154; 800/343-9204

Charisma

Charisma is theft. The charismatic leader weaves a relationship and a story so exciting, adventurous, and seemingly important that the follower's humdrum life offers a poor comparison and is gladly thrown away for participation in the new grander life. Very few charismatic leaders are responsible enough to give those lives back once the story goes astray. The only examples I can think of are Ken Kesey and Krishnamurti.

This book examines three cases of pathological charisma — Adolph Hitler, Charles Manson, empowered by the very same sixties beliefs that created the Whole Earth Catalog; and Jim Jones and People's Temple. Such romantic immersion in the One True Cause



Charisma

Charles Lindholm.

Blackwell Publishers, 1990; 238 pp.

\$36.95 (\$39.45 postpaid) from American
International Distribution Corp., 64 Depot
Road, Colchester, VT 05446; 800/488-2665

embodied in the One True Leader! Such exploits of discipline and self-sacrifice! Such incredibly wild adventures! These movements were great fun. They always are. —SB

[A]fter his victory, Hitler refused to compromise with rationalized order and institutionalization, and managed to continue a charismatic movement even within the framework of government. He achieved this in part by keeping himself at the center of all decision-making, while simultaneously refusing to articulate any specific policies whatsoever. "You could never pin him down, say that he was this thing or that thing, everything was floating, without roots, intangible and mediumistic" (Hanfstaengl 1957: 129). His entourage were therefore never sure of what their leader really wanted, and they spent great effort trying to intuit his inner desires, thereby increasing his psychic centrality in their lives and enhancing their dependence on him.

The way Hitler enacted his role as leader also increased his charisma in another way, since the Führer's distance from daily affairs and his role as mediator kept him apart from the perceived corruption and incompetence of the Nazi Party. His aloof stance not only protected his stature, but increased it, since the people looked to their great leader as their salvation from the injustices and cruelties imposed by his minions — "If only Hitler knew . . ." The Nazi Party could therefore lose popular support,

as indeed it did during the war years, while approval of Hitler remained impressively high right until the end.

Once converts had been fused into the group, Manson held their loyalty with a self-conscious combination of private flattery and public humiliation, keeping the devotees continually uncertain of his real feelings about them, continually struggling to make "Charlie" love them more, continually proving themselves to him by subordinating themselves ever more completely, continually rivaling with their competitors for his attention, yet bound together by shared adoration for him. And, like Hitler, he kept his orders and relationships vague and often contradictory, forcing the followers to intuit his desires and thus to focus increasingly on him. "There was a hug here, a smile there, with no dependable pattern. But he had me hooked" (Atkins 1977: 89).

Their shared deceptions about Jones's ability to heal, about his sexuality, about his omnipotence, which were originally engaged in for the sake of group solidarity, also increased commitment among the elite by eroding their own ability to distinguish between truth and falsehood. Lies constantly repeated have a transforming effect, redefining reality not only for the listener, but for the speaker as well, who sees that the delusions become reality, and that assertions of transcendent power are associated with the actual inner experience of transcendence.

Which Side Are You On?

I'd bet most *Whole Earth* readers — indeed, most of North America — shares my sense of peculiar ambivalence about the labor movement. (And how many subjects do *Whole Earth* readers and the rest of North America agree about? Not many.) Here is a personally intense memoir by a yuppie-turned-labor-lawyer, first with the miners of West Virginia, then with the steelworkers of Chicago, and then with dissident Teamsters across America. I've devoured every history of the 1970s and 1980s I can find, and this is far and away the most memorable — partly because of the author's memory for detail; mostly because he sees something few of us can articulate. Why do people feel ambivalent about labor? Because we are torn between our genuine desire for a world of equal opportunity (especially within industry) and our wish to feel superior. (Note how popular the egalitarian Army became, for instance, when it began advertising "Be all you can be." Geoghegan is a street poet in lawyer's clothing, crawling (as he puts it) at the bottom of the upper class, wrestling with the questions of what people are worth and how to help them earn it. —Art Kleiner

Some day a philosopher, or linguist, or deconstructionist, can explain to me how people can do business, conduct public affairs, by saying back and forth, "Fuck you" and "Fuck you." Was this how they did it in ancient Athens, the first democracy? It's the most degrading thing about being a labor lawyer. The whole English language drops away, and this "fuck talk" takes over. A few years ago, I had to present a case to a jury, and relate what went on at a union hall. My client, being a literal man, got up and told his story, literally, and didn't leave out a single word.

"So, Mr. X, can you tell us what was said?"
 "'Fuck you.'"

"And was there any response?"

"Yes. 'You scum-shit, fuck you.'"

We went through days of testimony this way. And I kept seeing two or three suburban matrons on the jury, looking at me.

"What have you done with your life?" they seemed to be saying with their eyes.

In one afternoon of work, the U.S. Congress could fix not only the problems of American labor but the entire cultural crisis of the West, by passing a law that requires an outside neutral agency to count the ballots in local-union elections. Well, perhaps there should be a few more provisions:

Require a rank-and-file vote for all officers.

Give all bona fide candidates a copy of the membership list.

Provide "public funding" from the union treasury for all the candidates.

I guess it is madness, delusion on my part, to think that simply changing the law would make so much difference. The cultural crisis of the West would continue unabated. But I'm a lawyer, so what can you expect? I think everything can be fixed by a law. A writer of any depth, like an Orwell or Camus, wouldn't be so shallow or mechanistic, or tell their readers to write to Congress. But then anyone with depth, anyone serious, wouldn't have thrown away his life dealing with the Department of Labor.

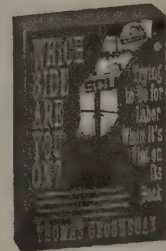
It's true that there is a law already that requires union democracy, the Landrum-Griffin Act. But the Act is something of a joke.

Which Side Are You On?

(Trying to Be for Labor
 When It's Flat on Its Back)

Thomas Geoghegan.
 Plume Books, 1991; 287 pp.

\$11 (\$13 postpaid) from Penguin
 USA/Cash Sales, 120 Woodbine Street,
 Bergenfield, NJ 07621; 800/253-6476



In the Mirror of the Past

Success stopped many a bright mind in the sixties. That could easily have happened to the celebrated author of *Deschooling Society*, *Medical Nemesis*, and *Tools for Conviviality*, but it surely did not. Ivan Illich, trained with the full scope of Catholicism, seemed in the 1970s to veer from radical critique of modern times into deep study and re-appraisal of history. But what he brought back was even more radical perspective on present institutions than he had before. This collection of lecture/essays (some of which appeared in *Whole Earth Review*) spans his astonishing range — economics, education, language, medicine, communications — all judged against vernacular life lived whole in the historical past and the Third World present. —SB

In the Mirror of the Past

(Lectures and Addresses 1978-1990)

Ivan Illich. Marion Boyars
 Publishers Ltd., 1992; 231 pp.

\$24.95 (\$28.45 postpaid) from Rizzoli
 International Publications, 300 Park Avenue
 S., New York, NY 10010; 800/462-2387



I study history as an antidote to obsessive speculations about the future. For the historian the present appears as the future of the past.

Dwelling is an activity that lies beyond the reach of the architect not only because it is a popular art; not only because it goes on and on in waves that escape his control; not only because it is of a tender complexity outside of the horizon of mere biologists and system analysts; but above all because no two communities dwell alike. Habit and habitat say almost the same. Each vernacular architecture (to use the anthropologist's term) is as unique as vernacular speech. The art of living in its entirety — that is, the art of loving and dreaming, of suffering and dying — makes each lifestyle unique. And therefore this art is much too complex to be taught by the methods of a Comenius or Pestalozzi, by a schoolmaster or by TV. It is an art which can only be picked up. Each person becomes a vernacular builder and a vernacular speaker by growing up, by moving from one initiation to the next in becoming either a male or a female inhabitant. Therefore the Cartesian, three-dimensional, homogeneous space into which the architect builds, and the vernacular space which dwelling brings into existence, constitute different classes of space.

When technical terms are ferried into an ethical discourse, they almost inevitably extinguish its moral meaning.

Real words have a nimbus. In contrast, terms are shorn of connotations. A nimbus of connotation surrounds words like a wind chime moved by the voice.

A Beginner's Guide to the World Economy

Well, they do, as the subtitle says, change the way I see the world — from confused to at least mildly cogent. A current project has forced me to catch up on economics by the seat of my pants. I never did understand it before, partly because the machinations of economic theory always seemed so arbitrary. They still seem arbitrary, but I finally have a gut feel about (for example) the concept of "float," the mechanism of exchange rates, and the forces that underlie the push for European economic unity. This book has its own agenda to push (pro-development, pro-Debt-for-Nature swaps), and it will be out of date in about two years (given the volatile evolution of the world's economy), but I find myself browsing in it regularly.

—Art Kleiner

■ What are Eurocurrencies and Eurobonds? During the cold war, the Soviet Union was reluctant to put too much of its U.S. dollar reserves under the control of the authorities in the United States. It turned instead to European banks to keep these dollars abroad, and those reserves became known as Eurodollars. Today, any currency held abroad, even outside Europe, is called a Eurocurrency. Japanese yen being held in a New York bank, for example, are called Euroyen, and French francs being held in a Hong Kong bank account are called Eurofrancs.

In the 1970s, a huge market developed for Eurocurrencies when Arab oil producers, following the example of the Soviet Union, began keeping a large part of their newly earned petrodollars in Europe. This flood of foreign capital needed to be invested, so banks began issuing U.S. dollar bonds, outside the control and regulations of the United States government. These were called Eurobonds because they were issued outside of the country of their currency. Banks and securities houses then began issuing Eurobonds in all of the world's other major currencies such as Japanese yen, German marks, Australian dollars, and French francs.

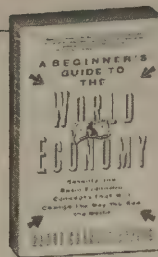
■ The currency of choice for most drug-related and other illegal transactions is the U.S. dollar. This partly explains why more than half of the U.S. greenbacks printed cannot be found anywhere in the American economy. Drug lords in the Far East, underground traders in Eastern Europe, and black market currency dealers in Latin America all make use of the U.S. dollar for their illegal activities.

A Beginner's Guide to the World Economy

(Seventy-one Basic Economic Concepts That Will Change the Way You See the World)

Randy Charles Epping, 1992; 153 pp.

\$10 (\$12 postpaid) from Random House/Order Dept., 400 Hahn Road, Westminster, MD 21157; 800/733-3000



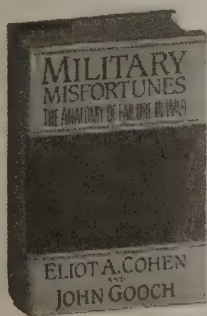
Military Misfortunes

No better book has been written on analyzing organizational failure than this, and few of any kind are as much fun to read.

In examining military debacles of this century, the authors — one a strategist, the other a military historian — discard the customary approach of blaming the losing commander as devoid of useful insight. Instead they focus on systemic problems divided into three main categories: Failure to learn; Failure to anticipate; Failure to adapt. Catastrophes-in-the-making develop slowly, with plenty of chance to notice and correct the downward spiral. What prevents that correction? Organizational defects.

The painful examples wonderfully re-examined are: the success of Nazi submarines in 1942 (failure to learn); Israeli retreat in the Yom Kippur War, 1973 (failure to anticipate); Gallipoli, 1915 (failure to adapt); American retreat in Korea, 1950 (aggregate failure); and the Fall of France in 1940 (catastrophic failure).

Most of us repress failure. This book



Military Misfortunes

(The Anatomy of Failure in War)

Eliot A. Cohen and John Gooch. Vintage, 1990; 320 pp.

\$11 (\$13 postpaid) from Random House/Order Dept., 400 Hahn Road, Westminster, MD 21157; 800/733-3000

teaches how to turn failure into gold. —SB

• First we must ask, What was the failure? To do this we must be willing to make a serious use of counterfactual analysis. More simply put, we must ask, What would have been required to transform failure into something less, a mere setback perhaps? Proceeding from this, our second question is, What were the critical tasks that went incomplete or unfulfilled? We look, in other words, at the key failures that determined the eventual outcome. Third, we conduct "layered analysis," examining the behavior of different levels of organization and their relative contributions to military misfortune. This procedure culminates in the fourth step, the drawing of an "analytical matrix," a simplified chart of failures that presents graphically the key problems leading to military misfortune. From this chart, finally, we derive our "pathways to misfortune" — the larger cause of the failure in question.

■ [In Korea] the Chinese did indeed respect American air power, but their organization and tactics allowed them to minimize its impact. By operating off the roads, at night, and close-in against UN forces, they negated much of the advantage of enemy air superiority. Their superlative camouflage and march discipline (soldiers stood stock still when an enemy airplane came into view, and officers had authority to shoot those who moved) hid them from aerial observation. In the short term, at any rate, and so long as they did not have long supply lines to maintain, the Chinese could conduct an offensive against American and ROK forces that the more conventional NKPA could not. They made of their material weakness, in other words, an operational strength.

• American statesmen and military leaders entered the Vietnam War in astonishing and deliberate ignorance of the French efforts there. In the words of one four-star general, "The French haven't won a war since Napoleon. What can we learn from them?"

Systems of Survival

I've been recommending this book as probably the most important we'll see this year. It explains many, maybe most, of society's current puzzlements and conflicts.

The thesis is: two contradictory moral codes ("systems of survival") dominate civilization. One is ancient — the Guardian (government) code; one is recent — the Commercial code. At their best they supplement each other splendidly. But when people lazily try to combine them, monsters result, such as organized crime or military-industrial collusion.

*The author, Jane Jacobs, is the one who reversed the destruction of the world's cities by "urban renewal" with her still-popular book, **The Death and Life of Great American Cities** (1963). She takes a chance with **Systems of Survival** by presenting the argument in the form of a group dialogue, and pulls it off. The reader is drawn into the conversation: "Wait a minute! What about academia? Where does that fit in?" —SB*

• The Commercial Moral Syndrome

- Shun force
- Come to voluntary agreements
- Be honest
- Collaborate easily with strangers and aliens
- Compete
- Respect contracts
- Use initiative and enterprise
- Be open to inventiveness and novelty
- Be efficient
- Promote comfort and convenience
- Dissent for the sake of the task
- Invest for productive purposes
- Be industrious
- Be thrifty
- Be optimistic

The Guardian Moral Syndrome

- Shun trading
- Exert prowess
- Be obedient and disciplined
- Adhere to tradition
- Respect hierarchy
- Be loyal
- Take vengeance
- Deceive for the sake of the task
- Make rich use of leisure
- Be ostentatious
- Dispense largesse
- Be exclusive
- Show fortitude
- Be fatalistic
- Treasure honor

• As individuals trying to be good, we aim at being both loyal and honest, for example. But in working life, these two virtues are

often in conflict; that is, we must be loyal at the expense of honesty or, conversely, honest at the expense of loyalty to our organization or fellow workers. Does this mean, as is so often concluded, that we can be "good" only in our private lives and that moral behavior must bend or break when we participate in the world's work?

No, that demoralizing notion is nonsense. Clear rules — if we heed them — tell us when honesty takes precedence and when loyalty does if the two conflict. Understanding the reasons for contradictions in the two systems of morals and values throws light on many conundrums: for example, why government-run businesses bog down in waste, inefficiency, and disappointed hopes, no matter what the system of government; when it is ethical to lie and deceive; when industriousness becomes a monstrous vice; what snobbery tells us; why there are no just resolutions for some types of debt defaults; why the practice of law embodies peculiar ethical problems; whether it is true or false that the mystiques of male bonding and loyalty come down to us from prehistoric hunting life; why governments cannot resist meddling in agriculture; why science flourishes only in societies that have achieved commercial vitality, but art can flourish magnificently in societies that lack commerce as well as in those that pursue it; what are the roots of class distinctions; whether organized crime models itself on government or business; and many other puzzles.

• "We're always saying 'the arts and sciences,' at least in the university we are, as if they were twins. But they have different parentage and differ in many other important ways as well. For instance, the arts can flourish magnificently in cultures and sub-cultures with little commerce to speak of. They often have. Science, on the contrary, develops only feebly in a culture until trade and production have already been developing vigorously. Oh, I don't mean that science is absent in noncommercial societies, or that an impulse toward it isn't ancient, maybe even universal. Or at least as universal as curiosity. All the same, scientific investigation proliferates and scientific knowledge ramifies and accumulates as a sequel to flourishing commercial life."

"Does that mean we can expect the Japanese to become leaders in science?" asked Hortense.

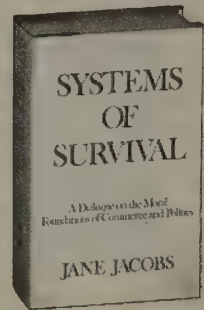
• Guardian values and rules, in their entirety, are so contradictory to the rules and values of science that it's worrying to see guardian assumptions creeping in as an accompaniment to government-dispensed research grants, which are now far and away the biggest sources for scientific research.

Systems of Survival

(A Dialogue on the Moral Foundations of Commerce and Politics)

Jane Jacobs, 1992; 192 pp.

\$22 (\$24 postpaid) from Random House/Order Dept., 400 Hahn Road, Westminister, MD 21157; 800/733-3000



■ Between 1960 or, say, 1955 and 1990, American industry has been restructured, as economists put it. Much has come under the control of people with a taking cast of mind, conquerors as unfit for guiding commercial life as Castro.

■ "That brings me to the word 'syndrome.' It comes from the Greek, meaning 'things that run together.' We customarily use it to mean a group of symptoms that characterize a given condition. In this case, the condition characterized by these symptoms is practice of viable commercial life.

"The B syndrome was more enigmatic. I wondered, What do these occupational groups have in common: armed forces and police, aristocracies and landed gentries, government ministries and their bureaucracies, commercial monopolies — that seemed an anomaly at first, but it isn't, — law courts, legislatures, religions and especially state religions? If this list is a syndrome too, I asked myself, then what condition does it characterize?"

"It finally struck me. They're all concerned with some aspect of territorial responsibilities. The condition is the work of protecting, acquiring, exploiting, administering, or controlling territories."

• "Over the course of time, corrupted organizations accumulate in a society. Without correction, the accompanying rancid cooperation blurs moral understanding in more than the afflicted organizations. People carry their blurred and blunted morality with them if they move into other organizations."

VALUE EARTH

BY DONELLA H. MEADOWS

If the world were a village of 1,000 people, it would include:

- 584 Asians
- 124 Africans
- 95 East and West Europeans
- 84 Latin Americans
- 55 Soviets (including for the moment Lithuanians, Latvians, Estonians, and other national groups)
- 52 North Americans
- 6 Australians and New Zealanders

The people of the village have considerable difficulty in communicating:

- 165 people speak Mandarin
- 86 English
- 83 Hindu/Urdu
- 64 Spanish
- 58 Russian
- 37 Arabic

That list accounts for the mother tongues of only half the villagers. The other half speak (in descending order of frequency) Bengali, Portuguese, Indonesian, Japanese, German, French, and 200 other languages.

In this village of 1,000 there are:

- 329 Christians (among them 187 Catholics, 84 Protestants, 31 Orthodox)
- 178 Moslems
- 167 "non-religious"
- 132 Hindus
- 60 Buddhists
- 45 atheists
- 3 Jews
- 86 all other religions

One-third (330) of the 1,000 people in the world village are children and only 60 are over the age of 65. Half the children are immunized against preventable infectious diseases such as measles and polio.

Just under half of the married women in the village have access to

and use modern contraceptives.

This year 28 babies will be born. Ten people will die, 3 of them for lack of food, 1 from cancer, 2 of the deaths are of babies born within the year. One person of the 1,000 is infected with the HIV virus; that person most likely has not yet developed a full-blown case of AIDS.

With the 28 births and 10 deaths, the population of the village next year will be 1,018.

In this 1,000-person community, 200 people receive 75 percent of the income; another 200 receive only 2 percent of the income.

Only 70 people of the 1,000 own an automobile (although some of the 70 own more than one automobile).

About one-third have access to clean, safe drinking water.

Of the 670 adults in the village, half are illiterate.

The village has six acres of land per person, 6,000 acres in all, of which

- 700 acres are cropland
- 1,400 acres pasture
- 1,900 acres woodland
- 2,000 acres desert, tundra, pavement and other wasteland

The woodland is declining rapidly; the wasteland is increasing. The other land categories are roughly stable.

The village allocates 83 percent of its fertilizer to 40 percent of its cropland — that owned by the richest and best-fed 270 people. Excess fertilizer running off this land causes pollution in lakes and wells. The remaining 60 percent of the land, with its 17 percent of the fertilizer, produces 28 percent of the food grains and feeds for 73 percent of the people. The average grain yield on that land is one-third the harvest achieved by the richer villagers.

In the village of 1,000 people, there are:

- 5 soldiers
- 7 teachers
- 1 doctor
- 3 refugees driven from home by war or drought

The village has a total budget each year, public and private, of over \$3 million — \$3,000 per person if it is distributed evenly (which, we have already seen, it isn't).

Of the total \$3 million:

- \$181,000 goes to weapons and warfare
- \$159,000 for education
- \$132,000 for health care

The village has buried beneath it enough explosive power in nuclear weapons to blow itself to smithereens many times over. These weapons are under the control of just 100 of the people. The other 900 people are watching them with deep anxiety, wondering whether they can learn to get along together; and if they do, whether they might set off the weapons anyway through inattention or technical bungling; and, if they ever decide to dismantle the weapons, where in the world village they would dispose of the radioactive materials of which the weapons are made. ☹

*Donella Meadows is the principal author of the controversial, upsetting, and influential (9 million in print, in 29 languages) *The Limits to Growth* (1972). Also based on a global computer model, that book's reassessing and even less reassuring sequel, *Beyond the Limits*, was published last year by Chelsea Green.*

*This text is most of one side of a poster published for the Earth Summit in Rio de Janeiro in June, 1992. The other side bears a photo portrait of Gaia, in Earth tones, against glossy black space. **Value Earth Poster**, 27"x39", is \$7 postpaid from Value Earth c/o David Copeland, 707 White Horse Pike, C-2, Absecon, NJ 08201; 609/641-2400 (fax 609/272-1571). —J. Baldwin*

Odd Couple

Whole Earth closed down forever in 1971, ending with *The Last Whole Earth Catalog* and *The Last Supplement* — the Supplement was co-guest-edited by Paul Krassner and Ken Kesey, cover by R. Crumb. It cranked back up again in 1973-74 with the first *CoEvolution Quarterly* and another book, *Whole Earth Epilog*, featuring an episodic satire in the lower right corner of the pages by Paul Krassner, "Tongue Fu." So *Whole Earth* isn't really 25 years old as a nonprofit business after all, only 23. What happened during the gap?

A popular TV situation comedy of the early seventies was "The Odd Couple," about two divorced men sharing an apartment, Tony Randall as the fussily neat one, Walter Matthau as the slob. In 1972, when I took a small apartment on Rose Alley in San Francisco and sublet a closet-sized room to Krassner, we found ourselves in the same situation comedy.

Paul wrote about that period for an autobiography soon to be published by Simon & Schuster, with the title *Confessions of a Raving,*

Unconfined Nut. Krassner's editor reportedly commented on the second draft, "It's a fucking masterpiece but it's too long." So six chapters were cut out entirely, including the "odd Couple" one. Therefore it is an honor to present to you now: PARTS THAT WERE LEFT OUT OF THE KRASSNER BOOK. (Paul got his first fame by making up and printing "Parts That Were Left Out of the Manchester Book" — pornographic but plausible segments of William Manchester's *Death of a President*, about the Kennedy assassination. Among other revelations, Lyndon Johnson is caught joyously fucking Kennedy's neck wound.) —SB



Place

What

happened

Whole Earth's

... I CONTINUED TO TRAVEL back and forth between Watsonville and my room in the basement of the lawyers' yellow-painted mansion in San Francisco. At the time, Stewart Brand's marriage was breaking up, and he moved to a room in the basement too. We shared a bathroom next to his room.

"During my first night in the room," Stewart confessed, "as I lay there awrith with loneliness, three young girls came down from a party upstairs and started a party of their own in the toilet on the other side of my thin board wall. It was interrupt, eavesdrop or kill myself. They discussed their first lesbian encounters, and how they learned to get off sexually on water fountains in high school, and compared notes on the bed habits of their host, and then one said, 'You know who has a room in this basement?' 'No, who?' 'Paul Krassner.' 'Paul *Krassner* — '(ecstatic moan)' — he's with the *Jefferson Airplane!*'" * I gave Stewart a key to my room so he could have access to the refrigerator, invited him to use my phone until he got his own, and offered my king-size waterbed for whenever I was in Watsonville. I hadn't intended for this to be bread cast upon the waterbed, but when the lawyers' mansion

* Paul *Kantner* was with the *Jefferson Airplane* rock band.

was sold and everybody had to move out, Stewart found an apartment on Rose Street — there were actual roses embedded in the tar along the street — and he agreed to let me rent the small room he used as a library. "It'll be on a trial basis," Stewart said, "as long as our lifestyles don't conflict."

Mae Brussell warned me against it. "I can smell a rat," she said. "And for sure Stewart Brand is a government pig. Be really

careful how much you tell him of yourself or your business. His kind can really hurt you in many ways. And do not put it past him. You are working in a dangerous area now and certain precautions are necessary."

"What are you saying — am I in some kind of physical danger?"

"No, but he'll try to psych you out."

I defied my conspiracy guru and took the room anyway. As you walked up the stairs to our apartment, you passed Stewart's styrofoam sailboat hanging on the wall. At the top of the stairway was a closet filled with his records. On the outside of the closet door there was a full-length mirror, so you could see yourself coming up the stairs. Stewart had taped onto the mirror a Christmas card from Gerd Stern with this message:

Bosatu or Bodhisattva (in Sanskrit) means the Way-seeker, Kan-jizai Bosatu or Avalokitesvara Bodhisattva is said to observe human suffering and change Himself, whenever necessary, into 33, hence an infinite number of, different guises to save mankind. Whenever He feels it best, He even appears as a harlot or a demon to truly save man. For this reason, anyone who appears before you should be regarded as the personification of Avalokitesvara Bodhisattva who has appeared to save you, namely, to guide you to spiritual enlightenment, in that appearance. Then you can, and must, be thankful to him

during

"lost"

years

no matter how harsh and unkind he may appear.

Three of the walls in my room were lined with bookshelves that Stewart had built for his library. One night the heaviest shelf collapsed, its contents falling all over my little cot. Had I been there, I might've been killed by his double-volume set of *The Ancient Art of Warfare* alone. On the remaining wall I taped a photo of my daughter Holly and a couple of posters. One was an American Indian. The other was Richard Nixon, with a quote from his inaugural address:

I think of what happened to Greece and Rome and you see what is left — only the pillars. What has happened, of course, is that great civilizations of the past, as they have become wealthy, as they have lost their will to live, to improve, they then have become subject to the decadence that eventually destroys the civilization. The United States is now reaching that point.

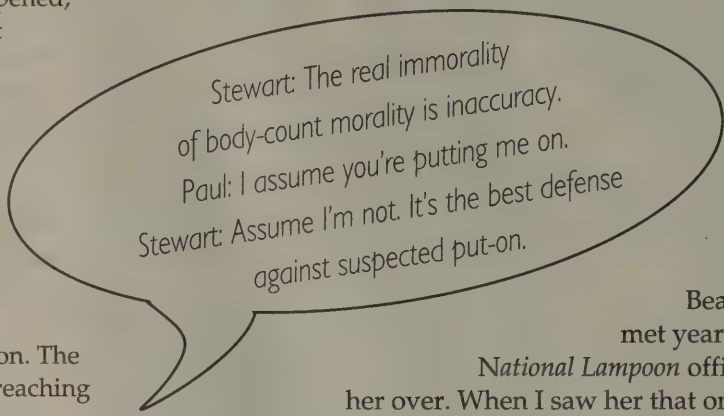
Stewart and I followed a hallowed tradition of brotherhood. Damon and Pythias. Simon and Garfunkel. Stanley and Livingston. Martin and Lewis. Lewis and Clarke. Huntley and Brinkley. Amos and Andy. Don Quixote and Pancho Sanza. Archie and Jughead. Brand and Krassner.

Stewart and I were different in appearance and style. He was tall. I was short. He had closely trimmed straight blond hair. I had long curly brown hair. His craggy features were those of a Nordic god. I resembled a friendly gargoyle. He wore a wristwatch even when he slept. I didn't wear one even when I was awake. He was neat and threw things away all the time; the stuff he kept was organized in filing cabinets. I was a sloppy packrat; I had a filing cabinet, but it remained empty.

Stewart was carnivorous and he ate meat. I was a vegetarian and I ate meat, but only about once a week, usually his leftovers while he was at the Zen Center a block away. Stewart had a strange sweet tooth. In college, his favorite snack was a slice of white bread with butter and sugar on it. Now he liked chocolate-chip yogurt and sesame-

graham cookies. He was a real cookie freak. He would even eat unbaked frozen cookie dough. He occasionally smoked cigarettes and drank wine. He turned me on to hot buttered rum and gave me a jar of batter for Christmas.

Occasionally, we'd go to a movie. I remarked that even though people were expected to leave their popcorn containers or ice-cream wrappers on the floor to be swept up by a theater employee, I found it difficult to do so. Stewart told me of his trip to Mexico with Stephanie Mills, where the streets were paved with garbage, and there they were, this pair of renowned environmentalists, both getting off on littering.



The closest we came to double-dating was when he cooked dinner for four.

I had gotten a call from Anne Beatts, whom I'd met years before at the

National Lampoon office, and I invited her over. When I saw her that one time in New York, she had curly hair, but now it was straightened. I didn't recognize her and thought she was Stewart's date, so I left her standing in the kitchen talking to him while I sat in my little bedroom watching the TV news. Only when Stewart's real date arrived did I realize how much need we had for a personal choreographer.

We would each entertain our own guests. Once I was in my room, playing host to Squeaky Fromme, while he was in his room, playing host to anthropologist Gregory Bateson. I would share my latest conspiracy theory with Stewart, and he would give me a copy of *Scientific American* with an article on the mathematics of coincidence. Our conversations were usually brief and to the point.

Stewart: The real immorality of body-count morality is inaccuracy.

Paul: I assume you're putting me on.

Stewart: Assume I'm not. It's the best defense against suspected put-on.

Or this one:

Stewart: We should admit to everybody that both *The Realist* and the *Whole Earth Catalog* were started with CIA money.

Paul: How are they gonna disprove it?

Stewart: Hire us. And then we can cause some international incidents.

Paul: I've never thought about the Central Intelligence Agency before as a way of working within the system.

Stewart: Did you know I'm starting an organization called the Peripheral Intelligence Agency?

Paul: My knowledge of it is an example of it.

Stewart: Precisely. You've been an agent for years. How can you prove that you're not working for *them*, once the kind of knowledge you have is the kind they seek?

Or this:

Stewart:

What's wrong with being an elitist?

Paul: Well, it's not spiritual, I guess.

Stewart: But all those spiritualist guys are elitists.

Paul: Well, it's hypocritical then.

And my personal favorite:

Paul: Do you think competition begins with the spermatozoa racing for the ovum?

Stewart: I think the sperm don't race, they dance around the ovum.

We observed each other's private idiosyncrasies. I noticed that he kept his National Book Award for *The Last Whole Earth Catalog* in his closet whereas he noticed me absentmindedly turning over thumbtacks on the windowsill so that nobody would accidentally stick their fingers. And we affected each other's sensibilities. One time I came home, looking forward to relaxing in a Mister Carrot Bubble Bath, but the tub was filled with Stewart's potted plants so that they could nourish themselves on water while he was away on a speaking tour, and I didn't have the heart to disturb them. Another time we were driving somewhere, and he stopped to help a stranded motorist with a jump-start, but admitted that he wouldn't have done so if I hadn't been in the car.

I HAD BEEN ENJOYING THC, a white powder featuring the ingredient in marijuana which gets one high; THC was like super-pot. On the night that The Committee was going to have its final performance, and while Walter Cronkite was

concluding the news with his customary, "That's the way it is," I snorted all the THC I had left, as preparation for a personal pilgrimage to The Committee for the end of a satirical era. The last thing I remember was brushing my teeth, talking to Stewart and being overwhelmed by the drone of his electric saw. Since I was out at the time, here's his description of what happened:

I had been building a bed while you stood in the hall doorway reporting the latest turns in your hassle with Scientology. After a prolonged peculiar silence, I peeked in the hall to find that you

were gone, replaced by a vacant-eyed robot which opened and closed its mouth, made a drifty gesture with a tube of toothpaste and said,

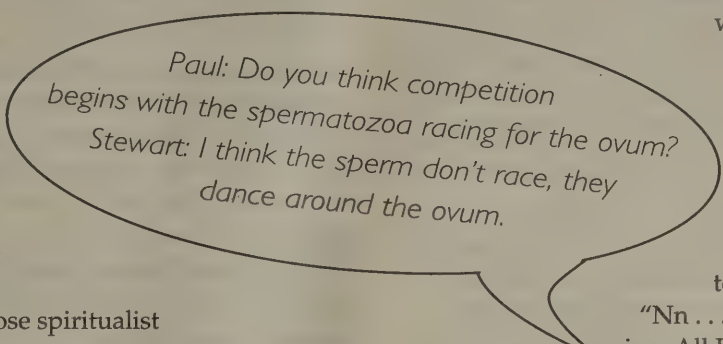
"Nn . . . Gn . . ." Terrifying. All I could think was

that the Scientologists must've

finally zapped you.

After a while the thing toppled like a tree, crash, and commenced baying into my buffalo rug. I phoned a friendly shrink for consultation. He listened to symptoms — you were by now into a howly slow-motion laugh, "Haaaaaa haaaaaa haaaaaa haaaaaa" — and the shrink suggested I take you to the UC hospital for evaluation. I told the nurse, "He's editor of *The Realist*." "Is that so?" she said politely. You spelled your name for her.

It was 11:30 that night when, as they say in comic books, I came to. I tried to fly so I could tell whether I was dreaming, but I couldn't flap my arms because I was attached to the bed by restraining devices. Was I still twelve years old, in a straitjacket in the polio ward? No, these were only canvas straps tying down my wrists and ankles. I was definitely awake, but I had no idea where I was or how I had gotten there. I would learn later that Stewart had brought me to this hospital with the aid of a couple of students from the Zen Center. I did remember a doctor asking me, "Okay, tiger, what'd you take?" I started to answer, "T-H—" — I was tempted to spell out THE ULTIMATE DRUG, but my motor control was not exactly a tightrope walker's prayer, and I had to struggle just to utter T-H-C. "Affording us bedsiders enormous relief,"



Stewart recalled later. "We didn't know what the hell you were down with. At the THC announcement, the doctor smiled and relaxed. 'Let him enjoy it.' On other subjects you had been equally loquacious. In answer to any question whatever — 'How you doin', Paul?' — you would intone, 'My name is Paul Krassner. I am editor of *The Realist*. P-A-U-L-K-R-uh-A-S-uh-S-N-R-E.'" Of course, I had assumed that I was in some secret government laboratory being debriefed by the CIA. A couple of friends, Dan O'Neill and Margaret Fisher, were leaning over my hospital bed. I managed to ask two questions: "Did they inject me with any drug?" and "Have they been taping what I've been saying?" It was my paranoid way of trying to bring things back into focus. Stewart was gone, but he had left a note for me on the table beside my bed.

9:30 p.m.
Hello Paul —

Since you're merely flipped out (stoned) and not dying, I'm gonna go meet my date. Background: You passed out in the hallway — at 7:30 p.m. I brought you to UC Emergency Hospital at 8. You started coming around at 8:30 and let us know you'd had some THC (and LSD?). Wavy or others may drop by later. I'll call in from time to time and I'll check by later.
—Stewart

P.S. You promised to tell the American people the truth. You also remarked that "It's OK!" Hope you remember details.

In our apartment the next day, Stewart said, "I would've put you to bed, but I thought you were having an epileptic fit."

"Did you stick a *TV Guide* in my mouth like you're supposed to?"

"You were doing fine with the buffalo rug."

ZODIAC, AN ALTERNATIVE NEWS service, issued this report in September, 1972:

The conspiracy trial of six members of Vietnam Veterans Against the War in Gainesville, Florida, has been postponed until after the November election.

Federal Judge David Middlebrook ruled in favor of the defense, which claimed that the Vietnam war would

be a political issue in the upcoming election and that the war would also be a major issue in the conspiracy trial. Judge Middlebrook said that the trial would be postponed "indefinitely" — until at least after the November election.

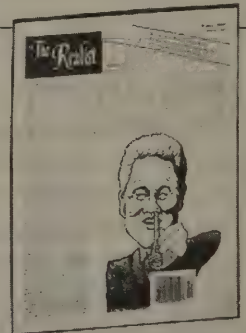
Prior to the judge's decision, the trial had been scheduled to start early next month. The six VVAW members have been accused of plotting to use a variety of bizarre weapons — including fried marbles, slingshots, crossbows, cherry bombs and scuba divers — to violently invade Miami Beach and attack the Republican Convention in August.

I immediately assumed it was a frame-up by provocateurs. *Fried marbles?* Of course! My perception of the logic of those in power was that if they accused the veterans of having fried marbles as a weapon, the public would think it was too bizarre *not* to be true. When I first learned that Richard Nixon's favorite meal was cottage cheese with ketchup, I went and tried that. So it was only natural that I would now fry me up some marbles. Stewart was already accustomed to these little acts of weirdness.

The Realist

When I first devised the *Whole Earth Catalog* in 1968 I was most inspired by two publications, themselves an odd couple — the L. L. Bean mail-order catalog and *The Realist*. Paul Krassner's modest six- to eight-page periodical felt like the antidote to the 1950s. It was cheerily defiant of authority and taboo, nothing-to-lose honest, with a wicked satirical edge. Like a Lenny Bruce in print (Bruce did appear in it from time to time). Every young writer in the early sixties was envious of Krassner's freedom and discipline.

All through his later years as a cultural commentator, stand-up comic, and occasional editor (such as a celebrated stint as editor of *Hustler*), people kept begging Krassner to revive *The Realist*, and he kept promising to. Years went by and we all gave up hope. But he finally did it, and *The Realist* of the nineties has precisely the form and kind of content it did thirty years ago, and it's valuable again. —SB



The Realist

Paul Krassner, Editor.

\$12/year (6 issues). Box 1230, Venice, CA 90294

■ —From *The Oldest Profession Times*: "Political satirists try to give sex workers a bad name by linking politics with prostitution."

■ New on the market: "Gotta Go!" — a gadget which duplicates the click of call-waiting. "Press it," says the ad, "you both hear the click, then tell them you've got another call." Presumably, Bill Clinton will use this device whenever Ross Perot calls.

"Just don't use my teflon pan," he requested.

I went shopping and found a place that sold marbles. I asked for the kind that were best for frying. The clerk laughed at what she had to believe was my idea of a joke. I returned home and melted butter in my saucepan. Then I fried two marbles. Apparently the purpose in weaponry was that when a fried marble is catapulted from a slingshot it will shatter upon hitting the target: the poor person's cluster bomb.

"Paul!" Stewart said in his best prissy Tony Randall voice. "You *sauteed* those marbles. A warm buttery marble is hardly an instrument of aggression. You should've added *sliced mushrooms*. At least follow the correct recipe: *Deep-fry* the marbles in fat hot enough to smoke slightly and then *plunge* them in cold water. *Zzzkk!* Ornamental little weapons."

I HAD A SMALL black-and-white TV set in my room, but when Stewart wasn't home, I would watch the color set in his room. One night in his room, I noticed a black-covered notebook which I assumed was a transcription of his interview with

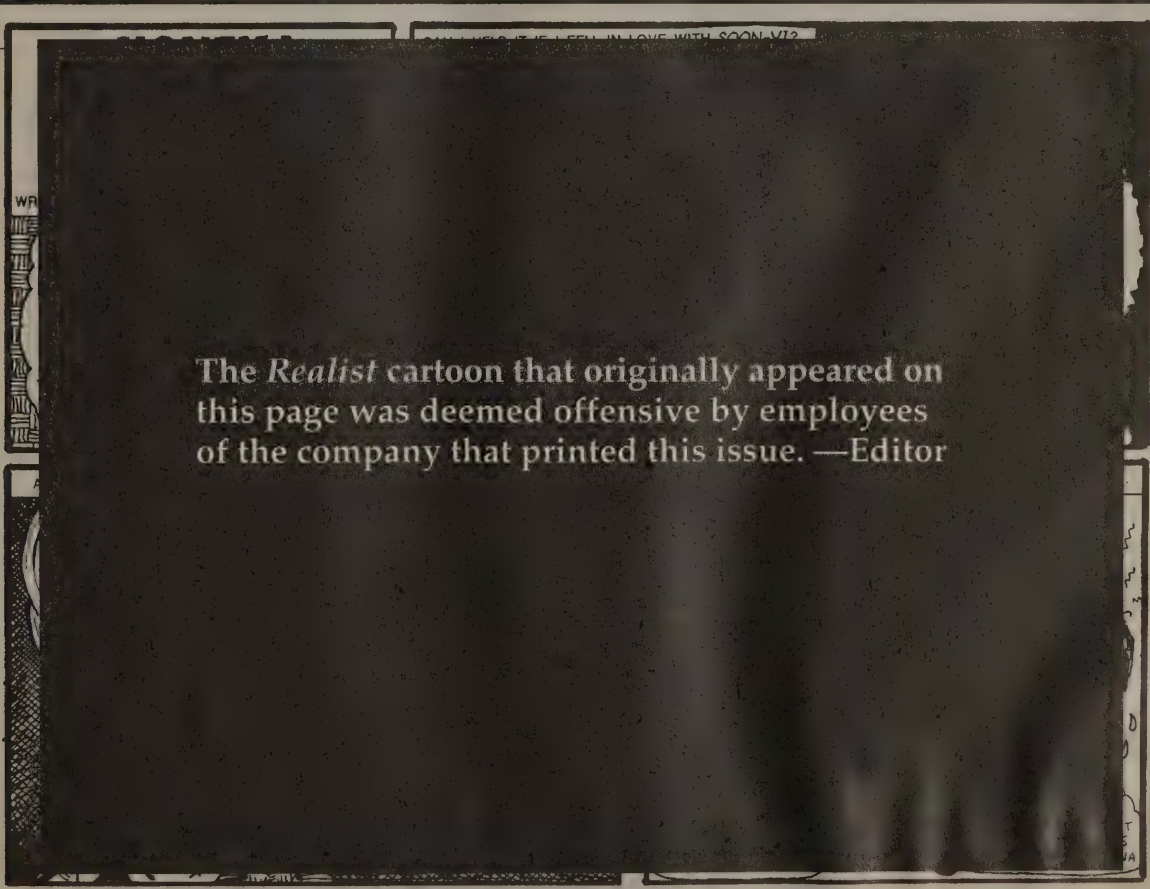
Gregory Bateson. As a lazy unbeliever's version of tossing the *I Ching*, I always used whatever was handy — a radio, a dictionary — even the *National Enquirer* could help crystallize a direction. I opened Stewart's notebook at random, circled my index finger in the air and then landed on this — *Paul, you're studied and off!* — in Stewart's handwriting. "Yaaagghhh," I whispered.

This was positively *weird*. Stewart had written to himself what he couldn't tell me. My impulse was to confess this accidental discovery immediately, but I didn't know when he'd be back. Still, I had to tell *somebody*. But who? Our mutual friend, Wavy Gravy! He'd be sure to understand. "Stewart's *diary*?" Wavy asked. "Paul, a diary is *inviolable*. But I suppose that's your role, the Cosmic Yenta."

"But I didn't *know* it was his diary. So, does being *inviolable* mean that you don't want to hear what he wrote about *you*?"

"All right. What did he write about me?"

"He doesn't even mention you."



The *Realist* cartoon that originally appeared on this page was deemed offensive by employees of the company that printed this issue. —Editor

I finally apologized to Stewart. "I hope you won't consider this a conflict in our lifestyles," I told him. "I mean it's not as if I *fried* your diary."

"It's just your talent for condensation as well as trespass — at last you've compressed crime and punishment into a single act. You blundered into a notebook in which I occasionally exercise ideas and exorcise demons. The damning statement about you was a low mood of vile self-opinion which projected itself onto a gallery of friends and family. To dispel the demon I wrote out the charges, and you strayed into the line of fire. Fortunately you know better than to take such a thing personally. All is forgiven."

I BEGAN WRITING *TONGUE FU*, the story of a Japanese-American with a fifteen-inch tongue. He belonged to a modern kamikaze organization for those who planned to commit suicide but wanted to accomplish something that would benefit society in the process. It was called Better Your Exit, or BYE. I showed the first three chapters to Stewart, and he agreed to serialize it in *CoEvolution Quarterly* and the *Whole Earth Epilog*. The fable served as an allegory for my conspiracy research and a catharsis for my recent psychotic episode, but the exorcism must have reversed itself. Nixon's Vice President, Spiro Agnew, had resigned in the face of a tax scandal; Gerald Ford was *appointed* Vice President, then Nixon resigned. Ford became President; he *selected* Nelson Rockefeller as his Vice President — for the first time in American history, we had a pair of executives in the White House who had not been elected — and I had a slight relapse. In keeping with the trickle-down theory of conspiracy, I then became suspicious of Stewart. Specifically, I managed to convince myself, without the slightest

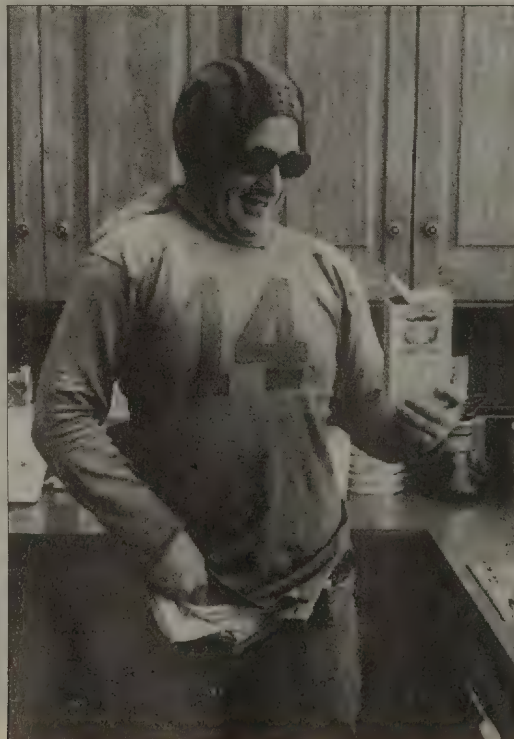
rational basis, that he had changed the ending of *Tongue Fu*. I decided to confront my paranoia. On an afternoon that Stewart was staying home, I took a bus to Sausalito. A man sat down next to me. Uh-oh, was he a CIA agent? We both had copies of the *Berkeley Barb*. I was reading the articles, and he was reading the sex ads. When we got to Sausalito, I walked to the houseboat where Stewart's office was, and I checked the galleys of *Tongue Fu*. Nothing had been changed. I felt silly, but I was okay again.

Back in the apartment, I didn't mention my little journey to Stewart. But I sensed that there was something vaguely different in my room. Then I finally realized what it was — my Richard Nixon poster. The president's eyes, which were usually looking toward the right, were now looking toward the left. It had that eerie effect of the Jesus face in the ashtray whose eyes follow you as you pass a novelty-shop window, except that Nixon's eyes were frozen in this new position. I examined the poster more closely and was able to discern that the original eyeballs had been whited out from the right side, and new eyeballs had been drawn at the left-hand corners. Then I checked to see whether the eyes in Holly's photo had also been changed, but no, she was still looking directly at me. So was my Indian guide. Only Nixon's eyes had been altered. It seemed out of character for Stewart to have done this, but I asked him anyway.

"No, it wasn't me," he said. "But Kesey was around for a while."

"Kesey! Of course! I should've realized it was him when I saw that telltale trail of cornstarch." * * *

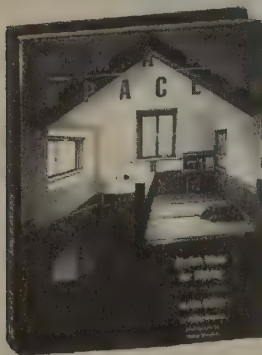
* In *The Last Supplement*, Ken Kesey had written and posed for an apparent advertisement that began, "I've used cornstarch on my balls for years." —SB



Small Spaces

Here's how to live elegantly in a manner that many Americans would consider claustrophobic (unless they were aboard an expensive yacht). Think house-as-jewelbox. The inspiration is modern, US-influenced Japanese, making the concepts and even the necessary attitude adjustments easy to adapt here. Living in a small place is one way to ameliorate prohibitive building and land costs while reducing energy and resource demand. A trend toward abbreviated abodes is now in progress in many cities. As a preferrer of small spaces (e.g. my office — admittedly more closety than jewelboxy: 5 x 7 ft), I consider this book a real find. —J. Baldwin

One of the paradoxes inherent in the teahouse — in fact, the genius of the thing — is that when the setting and company are just right, one ceases to be aware of space at all. To speak of selfhood and existence here might be cumbersome and out of place, but in plain terms, sometimes all one needs to be truly content is a perfect corner, a good book, and a cup of tea. If one thinks about designing one's home as discovering what one's own "perfect corner" needs, then one will be well on the way to learning to appreciate a small space precisely because of its smallness.



Small Spaces

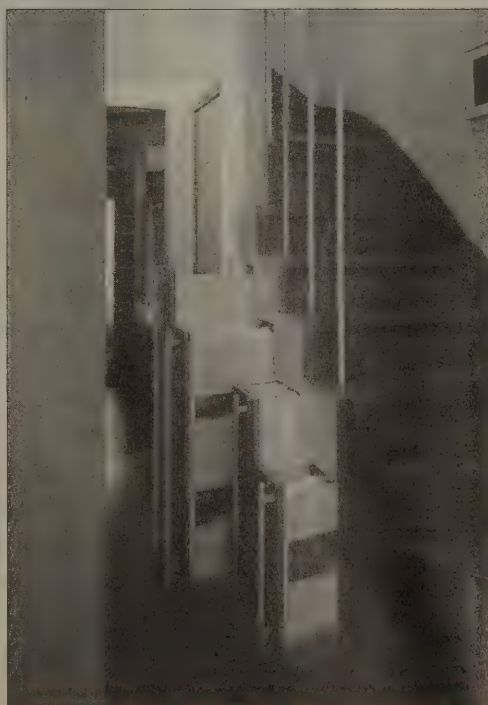
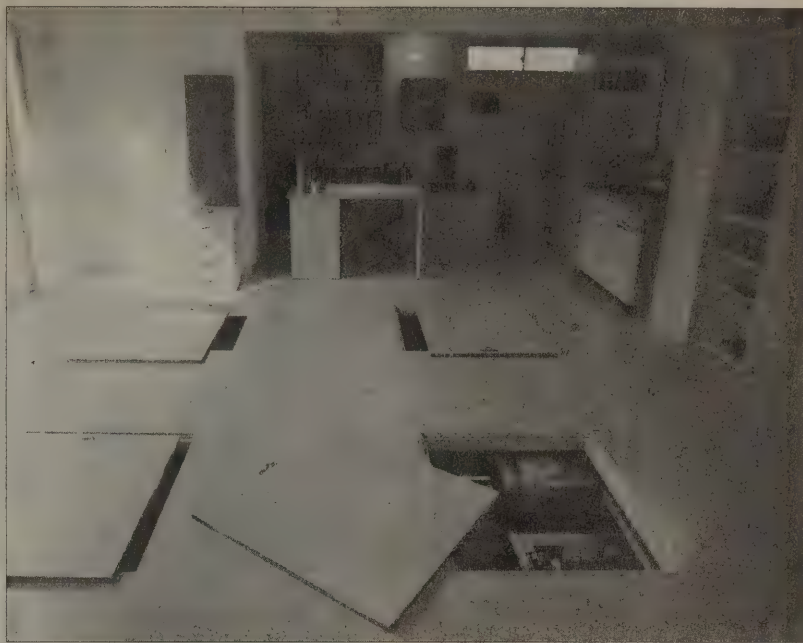
(Stylish Ideas for Making More of Less in the Home)

Azby Brown.

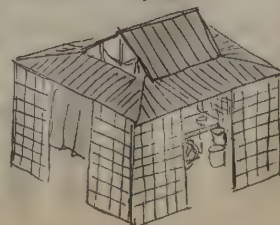
Kodansha International, 1993; 96 pp.

\$27 (\$29 postpaid) from Putnam Publishing Group/Order Dept., P. O. Box 506, East Rutherford, NJ 07073; 800/631-8571. Available June '93.

These stairs are used primarily to reach the children's bedrooms on the second floor, and are near the bathroom and laundry. Taking advantage of this, the architect has provided fully removable rolling cabinets for storing underwear and towels, where they are easily accessible on the way to and from the bathroom.



(Above) This part of the house is built on short posts which raise it about a foot above a solid concrete slab. The entire underfloor area is used for storage of paints, wood, tools, and other materials. The look is both utilitarian and a bit mysterious. (Left) This house was well-sited to take advantage of a southern exposure. Because of this, the architect and clients found lots of glass and a high ceiling in the main living area attractive. But how to maintain a more comfortably scaled height in the smaller rooms to the north? The result is this series of three intimately scaled, split-level children's bedrooms. Light is admitted through individual skylights and small windows at desk height. (Below) *Yatai* are traditional pushcarts, quite common to this day, serving food, liquor, and nocturnal warmth. The typical *Yatai* folds up and into itself for easy transport, but when open for business becomes a comfy small room.



My Children Explain The Big Issues

Feminism

I am walking up a long hill toward our water tank and pond. My daughter Montana, twenty-three months, has decided to accompany me. It is a very warm day, so she wears only diapers, cowboy boots, and a floral-print bonnet. At the outset I offer to carry her but she says "I walk," and then, "You don't have to hold my hand, daddy."

This is the longest walk she has taken without assistance. I see droplets of sweat on the bridge of her nose. Just before the water tank there is a steep pitch and loose gravel on the path, so I offer again to help.

Montana pulls away and says, "You don't have to hold my hand, daddy." A moment later she slips and falls flat. A pause while she rolls into a sitting position and considers, her mouth bent down. But quickly she scrambles up and slaps at the dirty places on her knees, then looks at me sidelong with a broad grin. "See?" 🐾



Montana Beth Baker.

Like Whole Earth's other landed gentry — Gary Snyder, Wendell Berry, Ken Kesey, Peter Warshall — Will Baker grows a cash crop of original thoughts and careful writings from solid rural ground. His ground happens to be in a small agricultural valley in Northern California, west of Sacramento. A longtime fiction and essay contributor to this magazine, his most notable works were journalism — rare apolitical insight on Nicaragua ("Ism in Rinkydinkaragua"; WER #46, Spring '85) and landmark research on planetized youth ("The Global Teenager"; WER #65, Winter '89). At Whole Earth's first "Think Globally, Dance Locally" event last fall, Will read these upside-down children's stories aloud. —SB

BY WILL BAKER

Fate

I first explained to Cole that there was no advantage in dumping the sand from his sandbox onto the patio. He would have more fun bulldozing and trucking inside the two-by-twelve frame. Heavy-equipment guys stayed within the boundaries, part of their job, and the sand would be no good scattered abroad, would get mixed with dead beetles and cat poop.

Next I warned him firmly not to shovel out his patrimony, warned him twice. The third time I physically removed him from the box and underscored my point very emphatically. At this stage, he was in danger of losing important privileges.

Reasonable tolerance had already been shown him and there was no further room for negotiation. There was a line in the sand. Did he understand the gravity of the situation? Between whimpers, he nodded.

The last time I lifted him by his ear, held his contorted face close to mine, and posed a furious question to him: "Why? Why are you doing this?"

Shaking all over with sobs of deep grief, he tried to answer.



Dylan Cole
Baker.

"Eyeadhoo."

"What!?"

"Eyeadhoo, eyeadhoo!"

One more second, grinding my teeth, and the translation came to me. I had to. I had to. 🐾

Existentialism

Cole is almost three and has had a sister now for four months. All his old things have been resurrected. Crib, changing table, car seat, backpack, bassinet. There have been visitors visiting, doctors doctoring, a washer and dryer always washing and drying.

He has taken to following me around when I go to work on a tractor or pump, cut firewood, or feed the horses. We are out of the house. It doesn't matter if it is raining. In our slickers and rubber boots we stride through a strip of orchard, on our way

to some small chore. I am involved with a problem of my own, fooling with a metaphor or calculating if it's time to spray for leaf curl. The rain drumming on the hood of the slicker, wet grass swooshing against the boots, I completely forget my son is there.

"Hey dad," he says suddenly, and I wake up, look down at him, and see that he is in a state of serious wonder, serious delight. "We're alone together, aren't we dad?" 🐾

East and West

My other daughter, Willa, is a Tibetan Buddhist nun on retreat. For three years I cannot see her. She writes me to explain subtle points of the doctrine of emptiness, or the merit in abandoning ego, serving others unselfishly.

I will write back to remind her of a party I took her to in 1970. The apartment was painted entirely in black, and candles were burning. There was loud music and a smell of incense and skunky weed. It was very crowded, some dancing and others talking and laughing. People were wearing ornaments of turquoise, bone, feather, and stained glass.

I glimpsed my six-year-old daughter, at midnight, sitting cross-legged on the floor opposite a young man with very long, blond hair. He had no shoes and his shirt was only a painted rag. They were in very deep conversation, eyes locked. I did not hear what the young man had just said, but I overheard my daughter very clearly, her voice definite and assured.

"But," she was saying, "you and I are *not* the same person." 🐾

Shadow Hunter

I do believe Will Baker will be hitting the big time with this ecological science-fiction thriller, due out in July. The publisher is so happy with it, Baker has been told to go ahead and write a sequel (which he mostly has, I gather).

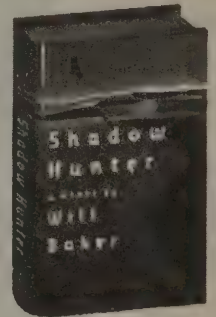
Shadow Hunter posits a conspiracy of the natural world to undermine the vast human superstructure of artifice and control. The harshly drawn native collaborators with the conspiracy reflect Baker's own unromantic experience with native peoples. The plot has parallels with Frank Herbert's *Dune*, but the quality of writing is a good deal finer, and *Dune* never made you read the daily papers differently, while *Shadow Hunter* does. —SB

Shadow Hunter

Will Baker.

Pocket Books,
1993; 373 pp.

\$21 (\$24 postpaid) from
Simon & Schuster/Order
Dept., 200 Old Tappan
Road, Old Tappan, NJ
07675; 800/223-2336



■ She had swallowed him. The mad, bad boy, the fish of fire, the great golden-eyed toad — all of him. For days he had squatted always within sight of her, singing his repertoire of the old songs. The wheels of Proud Mary, the white rabbit, a girl made of brown sugar. He did the same ones over and over, and each time she swayed and crooned and gibbered with delight, as if the melodies were exciting and new.

● The following day they washed off all his tagak paint and lashed him to pegs wedged in the rock. The old ones gathered and began a long chant, a retelling of the beginnings when the Hive-Dwellers awoke and shaped the world. Then two guards brought in what he thought at first was simply a little woven mat. Only when they approached to lay it upon his bare chest did he see, and hear, what it was. One side of the mat hummed and shimmered, for some painstaking

weaver had threaded or stitched dozens of wasps there. Held by a grass loop above the abdomen, partly stupefied with smoke, they were furious wasps, already jabbing convulsively with their venomous barbs.

He had no time to try the techniques Tima had talked about, to release his *kubi* from his body. The first shock of pain, icy and bitter, was followed by an immense, heavy agony. A white-hot anvil had been dropped into his chest, and his skull rang with the high, fierce buzzing of the wasps. He felt his eyeballs and tongue swell; the blood in his veins seemed like molten sulfur, and every nerve in his frame was wired to the jerking abdomens of the wasps. After his first convulsion and gasp he was laboring to fill his lungs, to scream, when he heard the Old Rat-Herder tell him cheerfully that if he made a sound they would kill Tima and feed her to him.

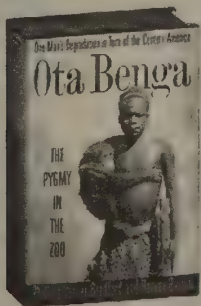
Ota Benga

It should be easier to flee into incredulity when reading this bizarre history. Ota Benga was a survivor of a Congolese pygmy community wiped out by the Belgian King Leopold's enforcers in the rubber and ivory trade. In 1903, he was purchased for some salt and a bolt of cloth by Samuel Phillips Verner.

Verner, the son of South Carolina slaveholders impoverished after the Civil War, was a failed missionary who was now trying to make a career for himself as an authority on Africa, or whatever else came to hand. When the committee organizing the 1904 St. Louis World's Fair decided to display specimens of humanity from all over the world, Verner turned in the low bid and got the contract to deliver pygmies. Ota Benga and his countrymen were displayed next to Geronimo, down the park from Zulus, Ainu, Patagonians, Kwakiutl, and many others. After the fair, Ota Benga was exhibited at the Bronx Zoo, and eventually released into the custody of the Howard Colored Orphan Asylum. When a liaison with a young woman was discovered, Ota Benga was sent away to the Lynchburg Baptist Seminary in Virginia, and befriended by Anne Spencer, famed poet of the Harlem Renaissance.

Verner's grandson turns in a sensitive, considered account of a time when anthropology and carnival sideshows were often indistinguishable. Revealing excerpts from the newspapers of the time show that most people, while intensely curious about this exotic person, had a complete lack of interest in Ota Benga as an individual who might himself be curious, or even sentient.

—Barbara Beaver

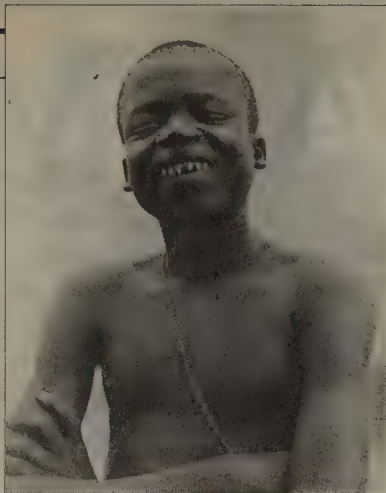


Ota Benga

(The Pygmy in the Zoo)

Phillips Verner Bradford and Harvey Blume. St. Martin's Press, 1992; 304 pp.

\$22.95 (\$26.45 postpaid) from Publishers Book & Audio, P. O. Box 070059, Staten Island, NY 10307; 800/288-2131



“Why do you dance so much, Ota?” Verner asked one morning, when the sheer beauty of the African scenery went some way toward compensating for the fact that at times he felt he didn't understand the first thing about the place.

Ota Benga displays filed teeth at the St. Louis Fair, probably for the agreed upon fee of a nickel or dime, payable in advance. Fairgoers — and anthropologists — liked to think filed teeth were a sign of cannibalism. In fact, such cosmetic dentistry is still practiced in many parts of Africa and has no relation to man-eating.

“Because they like it,” said Ota.

“Who likes it?”

“They do,” and Ota made a casual gesture toward the trees.

So pygmies thought of themselves as dancing on behalf of the trees, as representing them, as doing for trees what trees couldn't do for themselves. Pygmies were short, dancing trees; trees were tall, stationary, leafy pygmies. “Trees,” wrote Verner in his journal, under the topic “dance.”

Interrace

We go to the big city occasionally. Our small home town has a fair population of “hispanics” — a community evolved from settled farm laborers and their families — and seems racially tolerant, even racially eager. But there isn't a lot we have to tolerate. We are not the village described in “Value Earth” (p. 87), and therein lies a problem. We have an adopted daughter whose birth father is a black African-American and whose birth mother is caucasian; with golden skin and dark curls, she looks different from us and from almost everyone else in town. Her nursery school is full of tow-heads. Her presence enriches our town, but for the reciprocal feeling of belonging to a community of people that look like her — and us — we have to drive seventy miles to San Francisco. Then we go to the playground at Golden Gate Park and let calico waves of hybrid vigor wash over us.

Interrace discusses the increasingly common situation of multiracial relationships in a realistic and encouraging mix of articles, fiction, reviews, gossip, ads, and reader response. The magazine is obviously a labor of love and may be as invigorating as our trips to the city.

—Don Ryan

The point is obvious; obvious even to my own family which visited Ireland two summers ago in search of the O'Connellain homeland and found before them an utterly foreign country and people. Bound



Interrace

Candace L. Mills, Editor.

\$20/year (6 issues). P. O. Box 15566, Beverly Hills, CA 90209; 310/471-1472


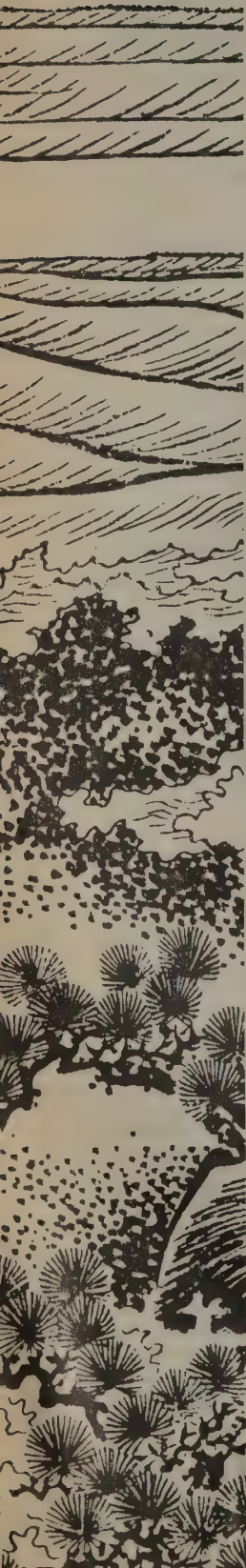
together by skin color, even common ancestry, the Irish are nonetheless entirely unfamiliar to the Americans who now call themselves Conlons. For, whatever it means, it is not race that bind us together — and keeps us apart — but *culture*, an entire set of assumptions and beliefs about society, government, and man's place in the universe which is a defining factor in the development of personality.

It would be stretching to say that any culture is color-blind. But it is indisputable that, as both my Peace Corps friends and my own family discovered, culture is a far more significant determinant of personality than skin color. It was a recurring theme among the Black volunteers that, whatever they felt about it, the experience of living in Africa brought them, as one told me, “in touch” with their “Americanness” — a response mirrored by my family in Ireland. Well, then, what do we talk about when we talk about race?

I believe we talk about culture.

K A M I

BY GEORGE PUTZ



BY LOCAL RECKONING we had not lived long on the island. But fifteen years seemed a long time to us; in fact a kind of forever. Though the lights of Boothbay loom on clear nights, we still have the feeling that everything is far away, and that, except for an occasional worry about the children and their families, we've managed finally to find our own calming of the waters — not only to get away, but to feel truly elsewhere, here on the island. Days and weeks blend and meld. For six months a year we don't wear watches, and the clock radio to which we once awakened is now several years silent, too.

I have to confess that I always thought phrases like "peace of mind" and "discovering yourself" were buzzwords used by people who didn't have enough to do. But since I've actually come to experience these things, all I can offer as proof and expression of them is an open apology to those whom we insulted or embarrassed by deriding those beliefs and feelings. Some people take longer to grow up than others, and, whatever, we worked very hard at our jobs, believed in what we did, and have conducted our retirement with the same vigor and confidence with which we engaged our work. It's just that, in finding inner peace, you have to be just as serious and intense, but in a sort of reverse. You have to be intense about emptying your mind. That sounds ridiculous, I know; but it's true. Learning to relax is hard work! When I think about how we used to thrash around this place, changing things all the time, I have to laugh to keep my self-respect.

I wouldn't bore you with these private matters unless there was a point to be made about them; which there is. All the things you used to hear about people with lucid spiritual lives, how they would attract others of like mind, turns out to be a fact. That's what I'm writing about. It's absolutely true, and has changed our thoughts about everything, forever.

This was two years ago now, in mid-October, during the Golden Days on the island. We had spent the midday figuring out how to haul the float ourselves in order to save money on caretaking, which has gone right out of sight in recent years. I'd taken the outboard over to Cranston's to borrow a couple of come-alongs for the project, and had been home perhaps twenty minutes when the junk sailed in and anchored.

At first we thought the craft to be one of those Colvin-designed steel yachts, using the Chinese-junk sail rig that he advocated — they're very popular in the Chesapeake among older sailors who want to keep sailing and not yet admitting to their nautical infirmities. As it turned out, it was not one of those, but the real thing: an

honest-to-God East Asian teak-built junk yacht. Not only that, but trailing astern was a real-for-true sampan tender.

I was sitting on the porch listening to Muriel cook (she always hums and whistles while she slings hash); watching the junk come into the anchorage, I came to realize how unique the boat was to be coming into our indifferent cove. We're pretty exposed to the southeast, and so don't get many yachts over a season's time — a dozen maybe, and then usually because a late-season snorter is threatening too much downhill work for small sailboats heading westward. This boat was a different deal; and as two people got into the sampan dinghy and began to row ashore, I called Muriel out to the porch, requesting a refill from the martini pitcher if it wasn't too much trouble.

Together we watched them come into the float. When it was clear to us that they intended to tie up and land, we set our drinks on the lobster-crate coffee table and walked down to meet them. Just as study of their boat had confirmed genuine Eastern origin, so closer focus on our visitors revealed oriental supercargo. Small, elderly, they were Japanese.

Even before they spoke, Mr. T'kisani and his wife Iisue (as we were to learn their names) pierced our hearts to the quick. There was something about their movement and bearing that held us back, waiting on the lawn instead of meeting them at the dock. They moved slowly, yet with a grace and precision that kept us to the yard. We waited for them there that way, but didn't feel foolish in doing so, as we would have for anyone else.

The couple filed up the path and stopped about twenty feet before us, their heads down. Then they bowed very low, and held themselves that way for what had to be fifteen seconds. It seemed interminable, and we were riveted where we stood. T'kisani held a tiny saké cup cradled in his hands and covered by a patch of white silk. Both of them had tears in their eyes; when finally we caught the signal and bowed in return, and they straightened, we found ourselves looking into the eyes of obvious and severe grief. These people were in deep trouble, and finally our social instincts rallied to our cultural ignorance.

Muriel came around from behind me and went directly to the woman. She took hold of the woman's hands and (I'm afraid in that patronizing English nuance we use with foreign strangers) asked what was wrong. In answer she only got a look of further distress. The man made a very quick bow to me, and said, "Not to disturb your house; but have much need — please!" He made another abbreviated bow, and then simply stared at me, at attention, like I remembered from war movies about the Pacific (my stint was in Italy) — the whole event was filled with a chaotic mixture of impressions and feelings — obviously, for all of us.

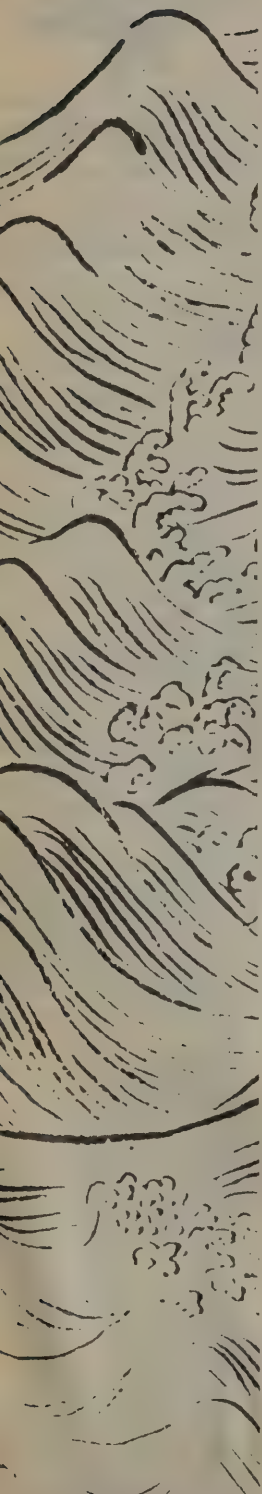
Muriel asked if they wouldn't please come up to the house and join us for supper or to talk (or something!). The man bowed and, staying that way, said, "Please, please wish to place dead. Please forgive this time. Kami dead. We wish to place Kami with own . . . not to bother . . ."

Muriel and I exchanged glances. I said, "Yes, of course . . ." and then, speaking to Muriel eye-to-eye, continued, "Of course, eh, sir; but who has died? Should we, er, call someone for help? Is there trouble — difficulty . . .?"

Somehow Iisue caught the drift of our concern; standing as she habitually did behind her husband, she bumped him gently. The small man understood immediately, straightened, and seemed to come to himself.



水終夜
有聲不
維畫水
且善畫
風曹仁



"No, no! No, is okay," he said. "Only small animal. Only long-time Kami of our family. Only friend. Please to give us place. Please to give us time."

The man made a half-bow and, with his eyes on mine, held forth the saké cup, removing the tiny silk covering. Still holding Iisue's hand, Muriel came around with the woman to peer into the cup.

I had to focus carefully to believe what I, what we, saw. It was a dog — like a ceramic miniature, but a dog nevertheless, and one that was real even if dead. It could not possibly have been larger than one of the tiny meadow voles common to our island; yet there it was, as clearly a dog as those we had owned all our lives. Too big for a charm bracelet, say; it could easily have found an appropriate place on one of the gewgaw shelves that infest our place in Rochester.

Muriel looked hard at me — one of those messages that only the decades may effectively allow experienced couples; and I blurted out, "Yes; yes, of course . . . how may we help?" I found myself involuntarily bowing in quick little jerks as I said it. Christ, I couldn't believe it!

"No no no!" said the man. "Please to give us place for friend. That all."

He was emphatic enough to connect with our idyll-bound minds. Almost automatically we stepped aside, and I gestured toward the side of the cottage. Iisue kept her head down. T'kisani looked at me briefly, then solemnly marched in the offered direction. As they disappeared around the side of the building, we saw Iisue bring up her hands in (we learned later) a "mudra" for Buddhist prayer.

We could not stand the suspense; we rushed into the house. On the way across the porch, I grabbed the martini pitcher; we headed to the kitchen window, which overlooked the back yard. I was so excited that I forgot the soapstone sink under the window, and the glass pitcher tumbled from my unfortunate placement into the sink and oblivion. Muriel was so amazed that she didn't register it. It had been her mother's cut crystal.

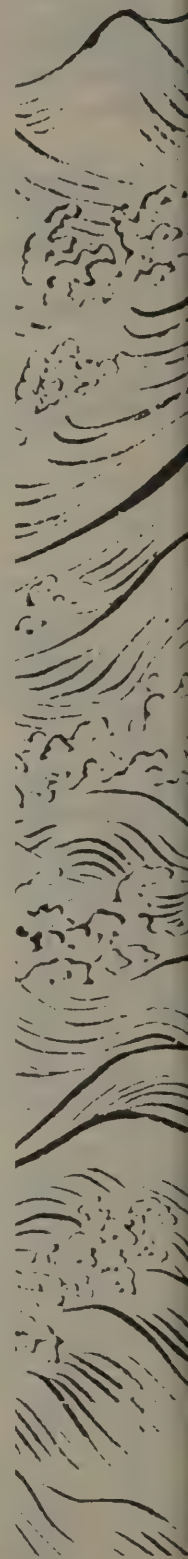
From the window we saw the whole ceremony. In a way it was terrifying. I tried to clean up the broken glass from the sink with one hand, while the other held on to Muriel's shoulder, to steady my concentration on the proceedings. The scene was so extraordinary. I missed the alcohol terribly, but I didn't dare leave the window to mix another batch. A half-hour before, a strange boat had anchored. Now I was witnessing an ancient Shinto rite for a microscopic dog!

It didn't take very long, actually. The old man pointed down into a patch of day-lilies that have grown there since forever. His wife nodded, and he quickly made a hole under and to the side of the lilies, and inserted the saké cup. Then he mounded the soil, picked a few asters growing next to the lilies and placed them on the tiny hill, withdrew four paces, and bowed low and long next to his wife. We saw their lips move but did not hear what they said. The whole thing was over in about fifteen minutes.

We left the window when they turned about and headed back around to the front yard, but not soon enough for them not to notice our surveillance. Their heads were bowed, but Iisue's eyes glanced our way in the window, and I felt like a peeping tom. But they were understanding. And their brief story was off the scale of all stories; of all time.

They came around the house and simply stood there, eyes down, obviously feeling awkward in anticipation of our response to the event. Again, Muriel was the one with initiative; she descended the steps to take Iisue's hand and lead her back to

峻嶒吳
道玄畫
大年之



捲山巨浪
排山倒海

the porch. Her husband was reticent, perhaps feeling that priorities and proprieties had been omitted or abused. He looked bewildered, and after another of Muriel's meaningful glances, I took the man aside, offering my curiosity.

It wasn't brilliant statesmanship. But T'kisani was grateful, and made up for my clumsy cordiality with sincere Eastern civility.

"Please forgive intrusion," he said. "Our . . ." he looked at me intensely. "Our — you say 'pet,' is very old. Three hundred years. Been in family for many generations, and this very sad time for us."

I stared at the tiny man with what Muriel calls my oh-God-what-now stupid grin. I knew enough not to reach out and touch him; but otherwise I was at a loss. Clearly uncomfortable, T'kisani was anxious to return to his boat. Later, after they had gone, Muriel and I pieced together the story from our respective interviews with the couple.

That little creature was a bonsai dog! For three hundred years Iisue's family (she was Samurai, the spiritual weight in the family — he a retired industrialist, more or less escaped from the usual system of Japanese senior citizenry, a maverick) had kept the tiny animal, trimming off strategic pieces of tissue, portions of subcutaneous glands, as the animal slowly matured over thirty-odd decades — in just such a way that the dog would thrive yet remain very small. The little bitch had had a litter in the early Tokagawa period (probably around 1763!); two of her offspring were still alive in Honsu, with the woman's relatives. Still, their little Kami, which means "spirit," was the grande dame of the lineage, and so the couple was especially upset at her loss.

While they were with us we sensed the importance of the event, and between us we learned enough details to piece the story together. It was only perhaps an hour and a half they were with us, and we're lucky to know what we do. Soon the old man began to look uncomfortable again; saying something abrupt, he quickly proceeded down the path to the dock, Iisue following close behind.

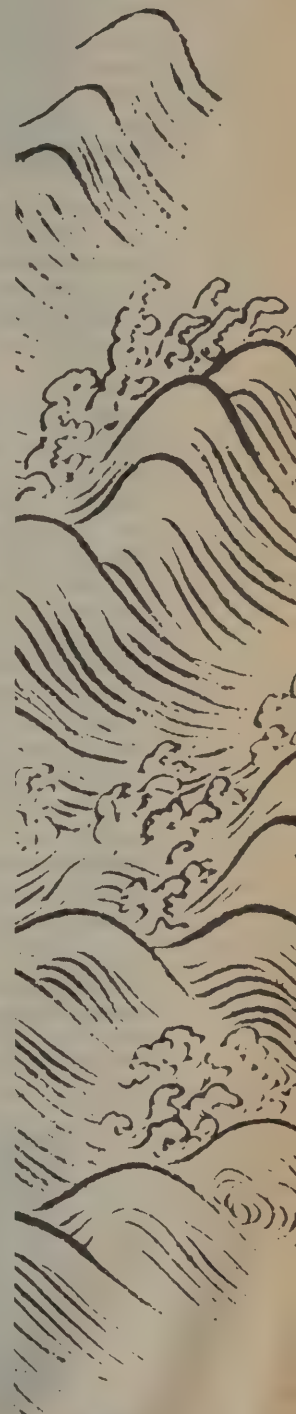
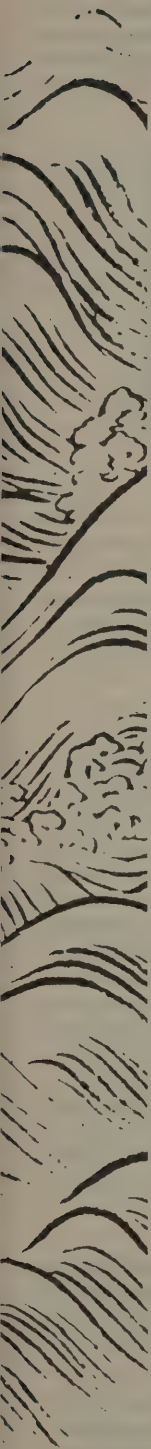
Now, we have had a lot of interesting people with interesting backgrounds drop by the island by happenstance and intention. While not known as a party cottage, we have over the years made lots of new friends, many just drop-of-a-hat people come to anchor off the dock, seeking water or cruising advice. But nothing like this peculiar old Japanese couple. They were very formal by our standards, perhaps; nevertheless we regard them among our most special visitors, and feel privileged to be stewards of their little dog, their Kami. We are grateful, for there is no question that the creature is a spirit, confirming us in our life and new attitude here. We were never big churchgoers, but somehow that little grave in the back yard has brought spiritual sensibilities and practice to our lives, adding to those of the island itself.

We wish we could meet them again. We want to thank them, to wish fair winds to them and to their ancestors. ☺

George Putz was busy dying from cancer last year when he sent me this piece, himself by then bonsai'd by the disease down to essence. "What is this story?" I asked him over the phone. "It's a reverie," he whispered. "It's something I wanted to try as a writer a while back." After giving another edit to the piece, he died a couple weeks later, age fifty.

Putz and his friend Peter Spectre were guest editors of a highly regarded "Oceans" issue of CoEvolution Quarterly (latterly Whole Earth Review) in the fall of 1979. For years they had collaborated on a wonderful series of access-to-tools books called The Mariner's Catalog. Putz's float on the shore of Vinalhaven Island, Maine, was exactly as evoked in this yarn. I landed there once, passage-worn, and encountered the same hospitality as Kami's family. —SB

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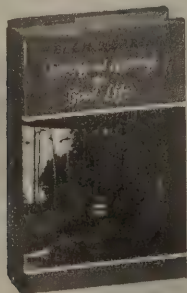


Loving and Leaving the Good Life

In this charmingly disorganized book Helen Nearing looks back over her life, emphasizing the half-century she shared with radical Scott Nearing in their search for the Good Life. Most of the Nearings' previous books were pragmatic, concerned with getting people onto homesteads where they could learn to be self-sufficient both physically and mentally, in line with the authors' continuing passion for remaking a world gone awry. This volume, in contrast, offers tidbits of wisdom, scraps of carefully saved letters, personal reminiscences and the inspirational story of Scott's intentional and gentle death by deliberate fasting just past his hundredth birthday.

Helen and Scott influenced countless people (one summer saw 2,300 visitors to their Maine farm — all unannounced, since they chose not to interrupt life with a telephone) through their books, lecture tours, magazine columns and, most of all, their example. With this book Helen continues the project of demonstrating the Good Life, and goes on to include the Good Death as well. Scott's recognition that his time had come led to a leavetaking perfectly consistent with his lifelong search for harmony. Though there are some unexplored contradictions here (chief among them the question of how much technology is too much), those in search of a quiet center and a program for reworking their own lives will find this a good place to start. —Mike Gunderloy

Living the good life for us was practicing harmony with the earth and all that lives on it. It was frugal living, self-sustaining, self-sustaining. It was earning our way by the sweat of our brows, beholden to no



Loving and Leaving the Good Life

Helen Nearing, 1992; 192 pp.

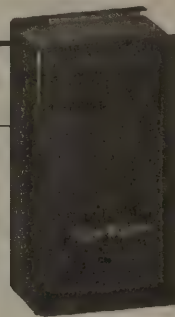
\$14.95 (\$17.95 postpaid) from Chelsea Green Publishing Co., 52 North Labombard Road, Lebanon, NH 03766; 800/639-4099 (or Whole Earth Access)

employer or job. It was growing our own food, building our own buildings, cutting our own wood, and providing for our own livelihood. We needed and used little money. If we couldn't pay for a thing, we made it ourselves or did without.

“You don't have to hold on to anything, my love,” I murmured to him. “Just let go of the body. Go with the tide. Flow with it. You have lived a fine life. You have done

your bit. Enter into a new life. Go into the light. Love goes with you. Everything here is all right.”

Slowly, gradually, he detached himself, breathing less and less, fainter and fainter; then he was off and free, like a dry leaf from the tree, floating down and away. “All . . . right,” he breathed, seeming to testify to the all-rightness of everything, and was gone. I felt the visible pass into the invisible.



The Tibetan Book of Living and Dying

It has become an article of faith in some circles that Tibetan Buddhism offers the best in Eastern spirituality for us Americans. Sometimes I wonder what is so attractive about a religious system reminiscent of Catholicism, full of saints and protectors, popes and nuns, a deified mother figure and a theocracy of men. About as often I think Tibetan Buddhism's charm for me is rooted in Bön (the indigenous religion) underpinnings, with its sorcerers and magic, local deities, customs and rites; in yoga, tantra; and in the authentic, incredibly warm and giving nature of Tibetans I have known. More importantly, I have inner assurance that certain Tibetans know something.

Tibet's karmic tragedy is our gain, and now comes a generation of Tibetans monkified in Tibet but maturing in the West. One such man is Sogyal Rinpoche, who has been working on *The Tibetan Book of Living and Dying*, a guide to awareness in both states, for ten years or more.

A look into the condition of gone-ness while still here is exhilarating. It is liberating just to do that much rather than simply beg to pass away in unconsciousness and hope for the best. Here are practical recipes for living well in the face of inevitable death, dying well, and helping those who have died. Not only practices, but case studies, experiences, and stories of great wit and compassion make this a book you can pick at, any time, any page, any mood. Its only real flaw is also a virtue — that it is not entirely relieved of Tibetan Buddhist specificity, which may impede some nonpractitioners or be taken as proselytization. Even these problems may only come about because the book is so assimilable that many non-Buddhists will read it. —R. Leveque

The Tibetan Book of Living and Dying

Sogyal Rinpoche. HarperSanFrancisco, 1992; 428 pp.

\$22 (\$24.75 postpaid) from HarperCollins Publishers/Direct Mail, P. O. Box 588, Dunmore, PA 18512; 800/331-3761 (or Whole Earth Access)

The most powerful time to do spiritual practice for someone who has died is during the forty-nine days of the bardo of becoming, placing special emphasis on the first twenty-one days. It is during these first three weeks that the dead have a stronger link with this life, which makes them more accessible to our help. So it is then that spiritual practice has a far greater possibility of influencing their future, and of affecting their chances for liberation, or at least a better rebirth. We should employ every means possible to help them then, as after the physical form of their next existence begins gradually to be determined — and this is said to happen between the twenty-first and forty-ninth day after death — the chance for real change is very much more limited.

Ego plays brilliantly on our fundamental fear of losing control, and of the unknown. We might say to ourselves: “I should really let go of ego, I'm in such pain; but if I do, what's going to happen to me?”

Ego will chime in, sweetly: “I know I'm sometimes a nuisance, and believe me, I quite understand if you want me to leave. But is that really what you want? Think: If I do go, what's going to happen to you? Who will look after you? Who will protect and care for you like I've done all these years?”

Healing and the Mind • Mind/Body Medicine

If you missed the recent television broadcasts of Bill Moyers' five-part series *Healing and the Mind*, here are videos, audiocassettes, and a book, all demonstrating how difficult it is to miss anything in this age of multimedia. The video- and audiocassettes cover identical broadcast material; the book provides full transcriptions of Moyers' interviews (and insight into how much editing is necessary to squeeze a subject into a one-hour format).

The best first choice, though, is another book entirely — *Mind/Body Medicine*, from the nonprofit Consumers Union, publishers of *Consumer Reports*. Like the Moyers series, it was funded by the Fetzer Institute, but it covers the same ground in much greater detail. Each chapter is by a different expert (the last chapter is by former *Whole Earth Catalog* medical editor Tom Ferguson).

The other thing worth owning from this smorgasbord of choices is the first of the Moyers videos, *The Mystery of Chi*. It functions as a beautiful travelog through China (the only segment of the series to venture outside the United States) and contains footage that needs to be seen to be believed. As someone using Western allopathic medicine, Chinese medicine and homeopathy on my own mind/body, I have a few bones to pick with Moyers' guide and interpreter, American M.D. David Eisenberg. He is so busy covering his Western medical professional ass that if you close your eyes and attend to his choice of language, you might think you are listening to testimony from a Senate confirmation hearing. Eisenberg leaves us with two choices: either Western medicine does not have all the answers, or a billion Chinese are utterly delusional. The disjunction between what is seen — acupuncture, herbal medicine, chi gung and more — and what is said, gives this video an interesting edge; but its larger contribution is clearly positive: this is where America wakes up and smells the ginseng.

For people who have been paying attention to alternative medicine for the last twenty years, there is little news in any of this material. For those who haven't, it's a comucopia. Throughout his distinguished career, Moyers has always aimed for and connected with the great American middle. His folksy "I'm just a Babbit ploughboy from Marshall, Texas" approach still works, because he combines childish wonder, grownup skepticism and a compassionate heart. No one else in broadcast journalism even comes close.

He is the great American popularizer.
—Richard Nilsen

■ **Candace Pert:** [W]e've actually found the material manifestation of emotions in these peptides and their receptors. . . . There's actually a physical attachment process between the peptide and the receptor. And once that binding process occurs, the receptor, which is a big, complicated molecule, wiggles and changes in such a way that things start to happen. Ions start pouring in, and other changes happen, and eventually the brain receptors perceive what's happening as emotions. . . .

Bill Moyers: Are you saying that the mind talks to the body, so to speak, through these neuropeptides?

Pert: Why are you making the mind outside of the body?

Moyers: It's been knocking around the West a long time — the notion that the mind is somehow distinct from the body.

Pert: Well, that just goes back to a turf deal that Descartes made with the Roman Catholic Church. He got to study science, as we know it, and left the soul, the mind, the emotions, and consciousness to the realm of the church. It's incredible how far Western science has come with that reductionist paradigm. But, unfortunately, more and more things don't quite fit into that paradigm. What's happening now may have to do with the integration of mind and matter.

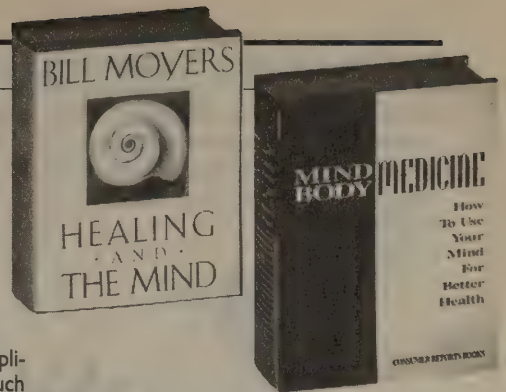
Moyers: We journalists are often guilty of missing the answer by posing the wrong question. I asked, "Is the mind talking to the body?" and you caught me on that. So if you were posing the question appropriately from your research, how would you phrase it?

Pert: I would ask, "How are mind and matter related to each other?" But remember, I'm a scientist, not a philosopher, and I get a little frightened if I'm pushed too far out of my realm. I think, though, that we have sufficient scientific evidence to hypothesize that these information molecules, these peptides and receptors, are the biochemicals of emotions. They are found in the parts of the brain that mediate emotion. They control the opening and closing of the blood vessels in your face, for example. They allow the systems of the body to talk to each other. . . .

Moyers: So instead of saying the mind is talking to the body, you would say "I'm talking to myself," because these neuropeptides are regulating the emotions that I "feel."

Pert: Yes. . . . —*Healing and the Mind*

● Other writers have done a disservice by claiming that people's illnesses are due to



Healing and the Mind

Bill Moyers. Doubleday, 1993; 369 pp.
Book or audiocassette version

\$25 (\$27.50 postpaid) from Bantam, Doubleday, Dell/Fulfillment Dept., 2451 S. Wolf Road, Des Plaines, IL 60018; 800/223-6834

5-volume videocassette version

Set **\$129.95** (\$134.95 postpaid)

Individual videos **\$29.95** (\$33.45 postpaid):

Vol. 1: *The Mystery of Chi*; 2: *Mind-Body Connection*; 3: *Healing From Within*; 4: *The Art of Healing*; 5: *Wounded Healers*.

All from Ambrose Video Publishing, Inc.: 800/633-1999

Mind/Body Medicine

(How to Use Your Mind for Better Health)

Daniel Goleman and Joel Gurin, Editors.
1993; 497 pp.

\$24.95 (\$27.45 postpaid) from Consumer Reports Books, 9180 LeSaint Drive, Fairfield, OH 45014; 513/860-1178

their "wishing" themselves to be sick. That unfortunate approach takes far too literally the connection between mind and body. Worse, it leaves sick people, who are already suffering, feeling guilty for their supposed role in becoming ill. No responsible advocate of mind/body medicine subscribes to that point of view.

■ One basic tenet of mind/body medicine is that it is best to treat the whole person: Treating emotional distress should be an essential complement to standard medical care. Another tenet is that people can be active participants in their own health care and may be able to prevent disease or shorten its course by taking steps to manage their own psychological states.

■ A number of well-designed studies now suggest that under certain conditions, which are not well understood, surgical patients can subconsciously pick up operating room conversation and be affected by it postsurgically. . . .

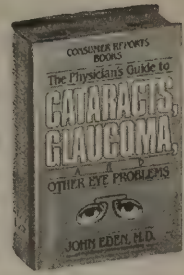
For patients, the message is: Protect yourself during surgery by using earplugs or, preferably, a cassette player.

—*Mind/Body Medicine*

The Physician's Guide to Cataracts, Glaucoma, and Other Eye Problems

Consumer Reports has a fine new line of health-care books. *Cataracts, Glaucoma* addresses aging readers whose aging eyes are likely to develop these and related problems. The news is good and getting

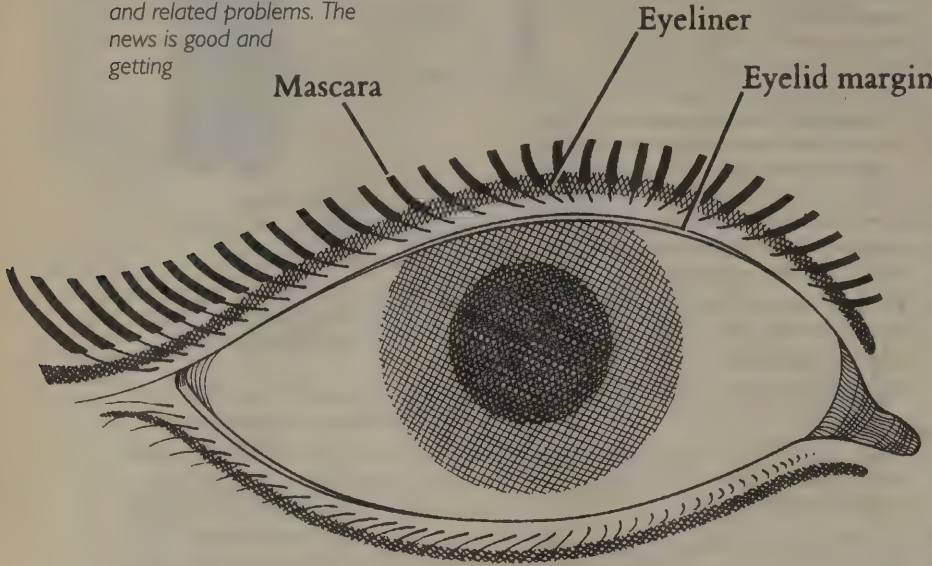
better — what was once terrifying is now mostly inconvenient. You should live so long as to have problems like these.
—Hank Roberts



The Physician's Guide to Cataracts, Glaucoma, and Other Eye Problems

John Eden, M.D., 1992; 224 pp.

\$18.95 (\$21.45 postpaid) from Consumer Reports Books, 9180 LeSant Drive, Fairfield, OH 45014; 513/860-1178



The safe way to apply eye makeup: Apply mascara to only the outer two-thirds of the eyelashes. Apply eyeliner outside the lash line, keeping it away from the eyelid margin.

LS&S Products for the Visually Impaired

You can tell time easily even in dim light; these watches and clocks feature huge numbers. Others tell you the time — in your choice of android English or Spanish. There's software for enlarging the print on screen and on paper; printers that perform in Braille; scanners that read aloud. Lighten up a bit with a noisy soccerball, a howling Frisbee-ish flying saucer, and playing cards with enormous symbols. There's even a good-quality Braille compass! Some of this unusual stuff is useful for folks with normal vision. You can try anything but the software for thirty days without penalty. Appropriately, the catalog is printed in big type, and is also available on refundable cassette. —J. Baldwin

LS&S Group

Print catalog free;
cassette catalog **\$3** (refundable).
P. O. Box 673, Northbrook, IL 60065;
800/468-4789 (in IL: 708/498-9777)

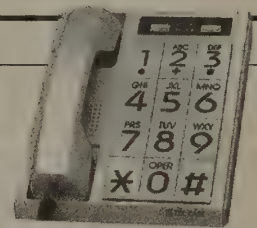


MAGNI-STAT

Makes Your Thermostat Easy To Read

The optical grade plastic magnifier fits the popular rounded Honeywell thermostat—plus other similar thermostats. **Enlarges thermostat plus** can be easily removed to use for enlarging small print, viewing details of stamps and coins, threading a needle, etc.

Model 214-32783
\$9.95

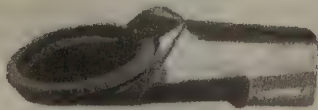


TEL-EASE TELEPHONE

Finally...A Phone Designed For Both The Visually & Hearing Impaired

Extra large buttons for easy dialing. White phone with black numbers includes: ten number memory and three colored emergency designator keys. The amplified receiver handset increases incoming volume an additional 20db. Hearing aid compatible receiver with three position ringer for high, low, and off...up to 90 db. Ringer tone control and flashing red ringer indicator light. Tone/pulse dialer and handy redial key. Includes phone number memo card. Desk or wall mount. Two year warranty.

Model 242-10502W
\$99.95



Easily embosses braille on 3/8" or 1/2" vinyl and magnetic tape. The upper rim of the dial is brailled—while the lower rim displays the standard alphabet. Available with: complete alphabet, number sign, commonly used contractions and word contractions, plus many punctuation marks. Can also be used as a standard alphabet labeler with the standard alphabet dial. Includes one spool of vinyl tape. One year warranty.

Model 203-BTW400/EA450
\$39.95

inLARGE 2.0

Software
Magnification For
Macintosh



Gives visually impaired full access to all mainstream software without additional equipment. **Magnifies everything on the screen as user types or moves the mouse.** Features: System 7 compatibility; choice of screen motion options; compatible with full range of

Macintosh technology; scanning mode; control from panel interface and keyboard; 2 to 16X magnification; reverse video; large, customizable crosshair indicator of cursor location; independent control of horizontal and vertical magnification; "magnifying glass" defines portion of screen for magnification and allows "blank out" of unmagnified portion. Requires: Macintosh Plus or better with 1 MB of RAM, Running System 6.05 or later, 100K of floppy disk or hard disk space.

Model 262-1L20
\$195.00



Back Designs

To listen to my fellow physicians talk about their own back problems — much less those of their patients — is to realize how little most doctors know about the back. The sum total of most physicians' medical school training about the back is less than a week, and it shows.

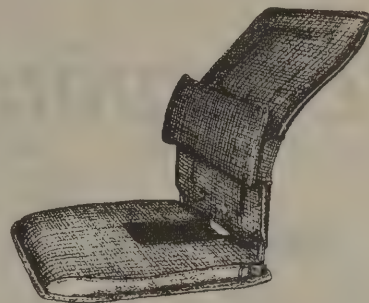
The single greatest element in my own self-care-of-the-back plan was this remarkable catalog, published by a store founded and directed by spinal-care clinicians. More than a list of the products Back Designs carries, it's an educational guide to adaptive rehabilitation through product intervention. Ergonomic desk and office chairs, portable sitting supports and neck pillows, corsets and stabilizing belts, beds and sleeping supports, massage tools and exercise aids: each product is profiled with regard to type of problem, body shape and size, activity, and comfort preferences.

First printed in 1989, the catalog was glogged within weeks. But it did not lead to earth-shattering mail-order sales;

it turns out that it is still very difficult to make decisions about comfort through the mail. For that reason, the catalog has never been reprinted. However, Back Designs regularly receives requests for it — as a kind of road map to what is out there, whether you buy from them or not — and they will send a photocopy of it anywhere in the US. They've updated it in various ways, handwritten corrections appear frequently, and there is an 800 number to call for current pricing and availability.
—Mark Renneker, M.D.

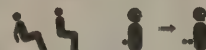
Back Designs

Catalog \$7.50 (in US). 614 Grand Avenue, Oakland, CA 94610; 510/451-6600



4103

A SACRO-EASE

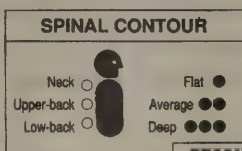


SACRO-EASE is the only support that holds up under heavy use by bus drivers, law enforcement officers, and traveling sales people. It provides a firm seat and flexible back contours. A detachable low-back pillow is included for those who like additional support. Each fabric-covered unit is made of durable rubber stretched around a steel frame which can be bent for a custom fit. Some models have added foam seat cushioning or coccyx cutaways for more height and sitting comfort. Available in 19" and 16" widths. Bending instructions are included. We provide free SACRO-EASE custom fitting at our store. Five-year manufacturer's warranty.

❖ **Comments:** For adults up to 250 pounds. For most effective support, select the narrowest SACRO-EASE you can fit. The 16"-wide model is usually best for bucket-type car seats. Will not fit in low-backed secretarial chairs.

blue, pepper grey, or brown tweed nylon fabric with vinyl trim

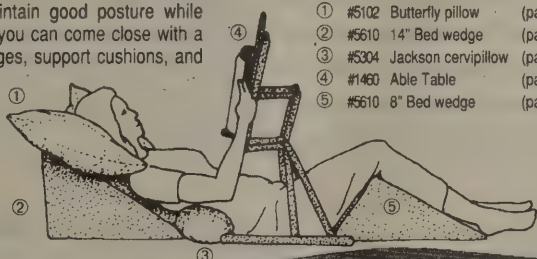
- 4101 Sacro-Ease 19" x 19", standard seat
 - 4102 Sacro-Ease 19" x 19", 1" cushion seat
 - 4103 Sacro-Ease 19" x 19", 1" coccyx cutaway seat
 - 4104 Sacro-Ease 16" x 19", standard seat
 - 4105 Sacro-Ease 16" x 19", 1" cushion seat
 - 4106 Sacro-Ease 16" x 19", 1" coccyx cutaway seat
- Additional fabrics, cushion options, and separate backrest models available by special order.



	RECOMMENDED USE		
	Reclined	Upright	Forward
Excellent			
Good			
Fair			

Reading in Bed

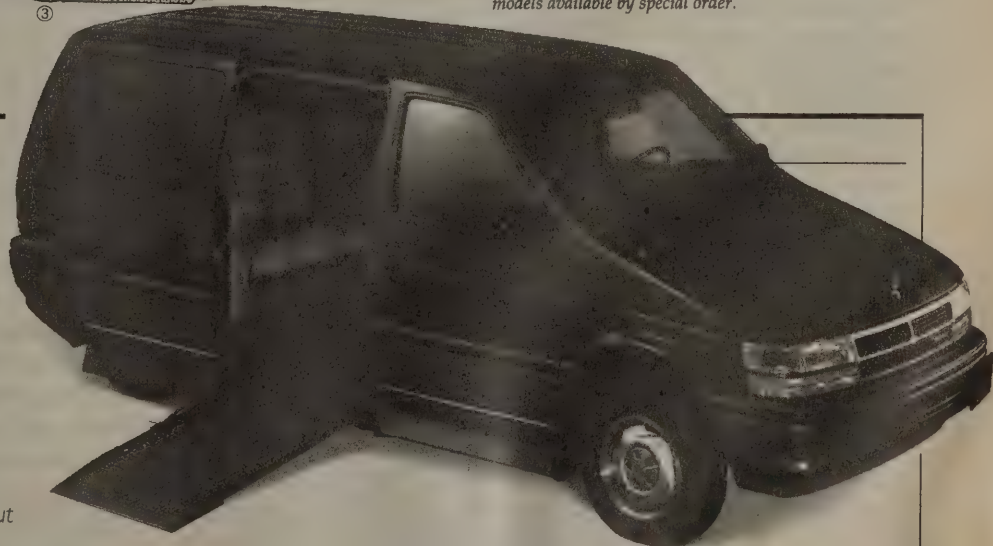
It is difficult to maintain good posture while reading in bed, but you can come close with a combination of wedges, support cushions, and reading aids.



- ① #5102 Butterfly pillow (page 50)
- ② #5610 14" Bed wedge (page 43)
- ③ #5304 Jackson cervicpillow (page 50)
- ④ #1460 Able Table (page 38)
- ⑤ #5610 8" Bed wedge (page 43)

Rampvan

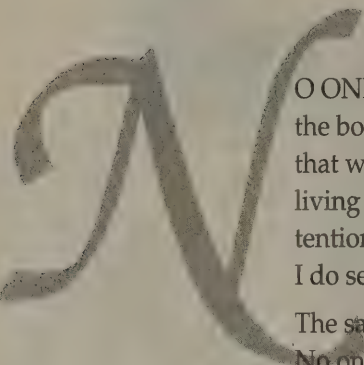
On command, this cleverly modified Dodge minivan "kneels" closer to the pavement, the side door slides open, and a ramp deploys. Wheel in, turn right, anchor in front of the controls, and you're ready to motor down the freeway in style. Rampvan is adaptable to a variety of needs, and has been extensively crash-tested. Its makers add their own warranty to Chrysler's. Costs about the same as a mid-range luxury car. Vets must buy the (unmodified) van, but Uncle will pay for the conversion. Used ones are available. I've observed several of these in action, and they seem to work very nicely. —J. Baldwin



Rampvan

Dealer (and other) information from Independent Mobility Systems, 4100 West Piedras Street, Farmington, NM 87401; 800/622-0623 or 505/326-4538

Escaping Eco-Echolalia



NO ONE IS QUITE SURE WHAT A FATHER IS ANY MORE. No one knows if it's the boyfriend living with your mother or her current husband or if it's the guy that was biologically responsible for your existence. The kids — all with different living arrangements — argue. Well, what's the right word, a word with no contention? What do I call this guy that I'm around all the time, or I don't see, or I do see sometimes.

The same contentiousness is heard among environmentalists and businesspeople. No one knows quite what words to use and how to talk to each other with grace, adventurous intellect, and fun.

This essay is a period piece, mulling over the difficulties and hopes of the moment — 1993 A.D. Can blue-suits and enviros make sense to each other? Can ecological lingo and business jargon create a happy marriage of tongues? Can bridges be built between the cartoon stereotypes — the financial Godzilla tearing the future from the Earth Mother's womb vs. the trust-fund Bunny-Lover with an insatiable appetite for wilderness, obstructing good citizens from catching a fine weekend trout and bringing bread to the table?

Field biologist Peter Warshall has been *Whole Earth's* resident wry, maniacal ecologist for over two decades. His *Watershed Issue* of *CoEvolution Quarterly* (Winter 1976/77) was the most popular theme issue we ever did. In recent years his freelance professional career has prospered, with jobs evaluating major conservation projects in Africa for the United Nations, serving as environmental consultant to multinational corporations such as Swedish Airlines (SAS) and Clorox, and re-designing the sewer and water system of Malibu — making more subtle the intimate cycle between movie-star digestive tracts and the Pacific Ocean. This article grew from a talk he gave in 1992 at an "EcoTech" conference in Monterey, California. —SB

Mini-Lesson 1: The Gap

At times, both sides use different words to describe approximately the same phenomena:

Ecology	Economics/Business
Gaia	Transnational
Planetary	Global
Biosphere	Worldwide
Whole Earth	Multinational

Just as an exercise, switch the "eco" vs. "econ" words around. If you're an ecologist or an environmentalist, try the word "global" every once in a while and see what it does to your brain. If you're in business or classical economics, try out "planetary" or even "gaian" and see how that works. We need a rendezvous between two vocabularies which, at the moment, sport only thin vines for bridges.

Mini-Lesson 2: Back to the Wellspring

Sometimes, from what I hear, I feel we are lost pilgrims yearning for the wellsprings of our speech, for the deep sources of our linguistic commonality. Three crucial words trickle down from Greek: ecology, economics, and ecotech.

"Ecology" has come to mean just about anything: grants and intellectual fads to the college crowd. Doom-gloom to the end-of-the-worlders. Mystical harmony to the nouveau pagans. The dictionary says *the scientific study of the interrelationship of organisms and their environment*. Unmasking these special uses, we find that "ecology" derives from: *oikos* + *logos*. *Oikos* means house or dwelling place; *logos* is primarily a word for discourse, thought or speech. To



BY PETER WARSHALL.

early Greeks, *logos* was the moving and regulating principle of things (associated with fire-energy) as well as that part of human nature that was able to see this ordering energy at work. (All the "-ologies" of English derive from *logos*.)

At its wellspring then, *ecology* means domestic chatter; talking about where you live; feeling out the household rules; remaining open and perceptive to the moving and regulating principle of your watershed and planet. It's a humble word. To those of us with an insatiable curiosity about the wild, *ecology* is a mischievous pleasure. We know we'll complete the picture of the governing patterns of Earth's household.

Oikos nomos became "*economics*." Originally connected to nomads (*nomas*) and their need to assign a portion of each herd to a particular pasture, and/or to count their livestock while on the move, *economics* evolved into "the allotment of any portion of goods; the customs or rules of accounting." In short, household management. Right now, *oikos*, the household, is becoming global; it is becoming necessary to extend the sense of what an orderly arrangement of accounting and economic management is about and, simultaneously, to return to the local folklore of its usage. Common phrases like "economy of scale" or "in hard times, the family economized" or, in painting, "an economy of detail" remind us of how nomads husbanded their resources. Economy, thrift and prudence are kissing cousins. In *Poor Richard's Almanac*, Benjamin Franklin summarized this sense of *oikos nomos* in his famous one-liner: waste not, want not.

Oikos + tekhnē, "*ecotech*," is a newly coined word, and it comes from, again, household + *tekhnē*. *Tekhnē* was the Greek word for weaving. It meant the art, skill, craft, and beauty of weaving. "Textile," "texture," and "text" and many parts of the warp of

the loom, are fabric-descriptions derived from the same Indo-European root (*teks-*). Humans extended the meaning to wattle house, you weave the sticks before daubing on the mud. Finally, *tekhnē* took on the general meaning of fabrication, of fabricating something out of earth's materials. Cutting dovetails with an axe in wood joinery — a carpenter's weave. When a human grew in the skill, he/she became an architect. Geologists extended *tekhnē* to the planet's (at times) woven and (at times) unravelling *tec-tonic* plates.

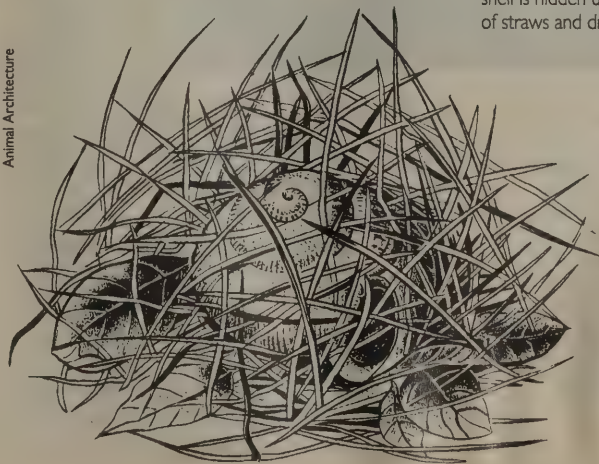
Imbued with neon industrial auras, "technical" has become a powerful word: there is a wonderful scene in Terry Southern's *Magic Christian* where a man places a Ritz cracker on a crack in the sidewalk around Times Square. He then smashes the Ritz cracker with a sledgehammer and proceeds thoughtfully, new cracker in hand, to the next sidewalk fissure. Soon a crowd envelops him and a cop, pushing through the crowd, asks: "What are you doing?" The man answers: "Oh, it's technical." And the cop replies: "Oh, I'm sorry," and walks away.

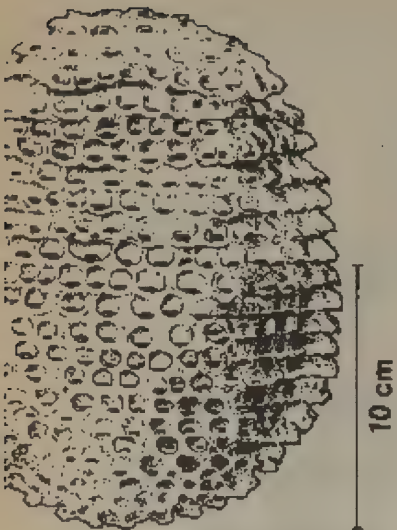
Ecotech, as we're hearing it today, centers on how we (all the species of the planet) fabricate the ecological house. It includes the woodpecker's tree hollow, the wasp's paper hive, the structure of the stream's channel, and the atmosphere's shells that shield us from too much ultraviolet radiation. Civil engineers still prefer the buzzword "infrastructure" for all the dams, pipes and storm sewers, because "infra-

"Ecology" has come to mean just about anything: grants and intellectual fads to the college crowd. Doom-gloom to the end-of-the-worlders. Mystical harmony to the nouveau pagans.

Nest of the mason bee *Osmia bicolor*. The uppermost whorls of the snail shell contain the bee-bread with the oblong egg of the bee. The bottom whorl is blocked with small pebbles behind a supporting wall of chewed leaves. The snail shell is hidden under a roof of straws and dry twigs.

Animal Architecture





The termite *Apicotermes gurgulifex* uses its own excrement to fashion a harmonious structure. The nest, about 20cm high, lies below ground and is surrounded by an air space. The surface is pierced by ventilation slits, each slit being surrounded by a raised ring. So precise is their pattern and spacing, slits appear to have been made mechanically.

structure" focuses on the ability of public works to increase a nation's capacity for trade, commerce and industrial expansion.

"Infrastructure" is too much society and not enough environment. Ecotech stresses the wider connections: maybe the dam brings cooling water to the power plant, but it may also block a fish migration. Infrastructure is embedded in human society. Ecotech (called by Stewart Brand "ecological infrastructure" or "ecostructure") is embedded in Earth's household. Ecotech learns from the governing forces of ecology and the prudent management of economy. How do we weave our planetary house together? And what are the skills to prudently exploit the Earth's materials?

Frankly, most times, it's all a tangle — as in Malibu, where I just helped map the landslides of the city. It's a town one mile wide, twenty-six miles long, the shape of a string bean; it has over 200 landslides. There's a great new word — a word locally invented to describe the real estate situation in Malibu — "geo-surfing." You used to surf on waves, then you surfed with wind; now, if you buy certain real estate in Malibu, you'll

surf with your million-dollar house down the side of a hill, dragging water and sewer pipes.

Among teks-derived words, my favorite is "subtle" (*sub + teks-la*). Subtle was, in its original meaning, a descrip-

tion of the fine thread used in weaving, that goes into guiding the actual structure of a rug. And so, at the wellspring, we find this other feeling: a more harmonious, "subtle" technology, not an infrastructure dominated by engineered devices thoughtlessly plunked down in watersheds or river basins or cities.

Ecotech is a return to the linguistic source, a quest for a new agreement between ecology, economics and business about what is

appropriate. In Malibu, in a constructed marsh, microbial and plant species may accomplish sewage treatment, replacing single-purpose mechanical devices. The marsh may also nurture the southernmost population of steelhead trout, and provide walking paths, ponds and fountains in the city center. The constructed wetland is but one example of this more gentle and subtle ecotech.

Mini-Lesson 3: Escaping From Eco-echolalia

By now, the prefix "eco-" echoes ad nauseam throughout the media: eco-friendly, eco-paper, eco-soap. *Customer* and *consumer* are words struggling for new meaning and for new life in the global village. From an ecologist's view, consumers and customers are also *receptors*. They're often receptors of toxic hazardous waste, of the by-products of business, or of the harmful aspects of the products they purchase. What we used to call a consumer or customer can then become a *victim*. Asbestos turned the consumer into a victim. Economics, organized for the welfare of humans, backfired.

Consumers are really not the end of the line. Products don't disappear after consumption — any more than feces disappear after you flush the toilet. Consumers are *transformers*. They buy products and then transform them into something else. Customers buy disposable baby diapers, use them and throw them out. Eco-friendly diapers (we hope) turn into humus or compost. Most join the swelling ranks of unsavory archaeological artifacts in city dumps.

On the one hand, the old language of business — is the person a consumer or a customer? — and then this new language that's trying to be born — is the citizen a receptor or a transformer? There is a well-known triangle in gestalt therapy. During household disputes, family members change roles, jumping from victim to persecutor to savior/hero and back again. In earth's household, the customer may now feel that he/she persecutes the Earth and then becomes its victim. Environmentally friendly products are trying to break the



Macrotermes natalensis building an arch, the two halves of which are about to be joined. The building material consists of droplets of excrement and soil particles. The arrow to the left points to a droplet of excrement that has just been deposited. The workers on the ends of the arches put down soil particles.

image of customer as persecutor/victim. But, before a new word emerges, the old words gets gummy with qualifiers: the green consumer or the eco-consumer. Hopefully, the consumer (or whatever word emerges) will soon transform into the hero, responsive and responsible savior of the planet — green, safe and satisfied.

Mini-Lesson 4: **Loaded Words**

In 1978, I walked into a Sacramento office to help settle a dispute about a wetlands development. A large man looked up and said: "Here comes the birder." To which his colleague added loudly: "Here comes the yellow-necked chicken." I somehow felt the drift. The consensus-building exercise was about to turn into a verbal food fight.

Bridging the chasm of wordage requires softening moralistic coloring. At times, there can be a heavy moral tone within the environmental movement. Words like "pollutant," "waste," or "contaminant" carry with them a kind of anger, even a sneer. The words may generate skepticism (here go the eco-whiners again) or fear (another mysterious substance may kill the kids). The industrial-business community tends to employ more neutral words like "residual" or "non-product output" which latently proclaim that they have these non-product outputs but the residual doesn't have a moral or ethical inclination; at least, the terms craftily avoid it.

There are benefits to the enviro words: they generate concern and, often, badly needed actions. The benefits of the biz terms are that they contain their own solution: the non-product yearns to become a useful product with its own profit margin, rather than an environmental cost. Once again, it is useful to switch lingos and surprise your alleged adversary.

Mini-Lesson 5: **What signifies production?**

There are a whole bunch of other words that sound exactly the same but have incredibly different meanings among the business vs. environmental communities — production, capital, health. The basic homonym is "production," a word that sings and soars to both sun-worshippers and avid subscribers to the *Wall Street Journal*. For me, the maniacal ecologist, "production" means organic fertility, awesome

biomass accumulation like an old-growth forest, the still-mysterious incorporation of solar energy into plants, and the ubiquitous sharing of photosynthetic products among Gaia's individuals and species. For the business community, "production" means an increase in the capacity of goods or services that can be sold to satisfy human desires.

Notice the processes between these two words are very different. In biology, production describes the entrapment of energy and water through photosynthesis and the subsequent development of living tissue (biomass). This is why old-growth forests become such a source of contention. It took so many years to accumulate that bank account of energy in an old-growth tree. On the other hand, if you're in business, you have to expend the resource (exploit it); you have to cut the old-growth tree in order to increase your capacity to sell wood, or to provide some kind of service like building a house, to satisfy needs. Although the words sound identical (pro-duk shən), the difference between depositing into vs. drawing down the planet's savings account is stark. Ecologists are talking about appreciation of goods: that is, the "growth" of an old-growth forest. The business community is worried about the depreciation of the goods, because the faster a product disappears, the more can be sold.

In business, you can also define production as the number of items a worker produces per time. Michael Macoby and others are questioning: should maximum return on labor input be the standard by which to measure economic production? In whose interests is it to improve productivity? If production is a social good (not just output/man-hour) what "performance measures" are reliable barometers of progress? To be a productive human requires good health, longevity, safety at work and commuting, creativity, freedom from fear, and, ultimately, wisdom. Put that in the Gross Domestic Product!

Another homonym is the word "capital." Natural capital on the planet is air, water, earth, minerals, plants and animals. A major amount of natural capital is slowly

There are benefits to the Enviro words: they generate concern and, often, badly needed actions. The benefits of the Biz terms are that they contain their own solution: the non-product yearns to become a useful product with its own profit margin, rather than an environmental cost. It is useful to switch lingos and surprise your alleged adversary.

In the new Chancery Court for the Planet Earth, products will be judged by their ability to minimize materials extracted from the biosphere's crust, to maximize recycling of already-extracted resources, to consume less energy, to fit harmlessly into existing watersheds, and to discharge fewer toxics. In the lingo, intergenerational equity is a futurist time-utility.

being destroyed and will become the concern of everybody on the planet. Capital, classically, in business has meant things like CDs, profits, stocks, bonds, debentures, treasury bills. We have oddball ways of accounting. The clean-up costs for the Valdez oil spill entered the GNP, but the costs in natural capital — pelagic fish, shellfish, cormorants, sea otters — didn't. The profit and financial costs, such as roadbuilding for logging, enter all balanced ledgers. But the drawdown of the timber resources and the forest's ecotech functions (as an anti-erosion device, atmospheric humidifier and pollutant filter, soil regenerator, and flood-control structure) are entirely overlooked in income accounting. How to get these two languages together is a great challenge of the next ten years.

Mini-Lesson 6: Dinosaur Wordage and Emergent Maxims

Some hapless words are going extinct or, at least, going through a radical transformation. One of the words that I hope goes extinct is "externalities," as it is employed in economics, public or private. Classical economics has always had this way of looking at the planet as a purely financial world in which certain things were external to it and not quite as important. Example: the publicly funded dams that were built during the 1930s in the Pacific Northwest. All the salmon were at that point considered an "externality." They weren't calculated into the economic equation. We built a lot of dams for good hydropower. We didn't spend the extra money to put in fish ladders, and now we're watching the collapse of the domestic salmon industry.

In the wake of the death of "externality," three new phrases are coming on stage. One is the phrase "existence value." Existence value is the value of a species or a piece of land — simply because it exists. The wonders of Yosemite. The heavenly float of condors. The reverent hypnosis of most any river. The rare, unique, beautiful. Power spots. These places and creatures simply have existence value. Until practically yesterday, existence values never played a part in economic theory.

When I work in sub-Saharan Africa, existence value comes up and economists

ask: Well, what is its "nonconsumptive use value?" This is Phrase Two. Nonconsumptive use value is, say, a lion. A lion in Amboselli Game Reserve brings in somewhere like \$25,000 a year, if you calculate the Big Five (rhino, elephant, lion, leopard and water buffalo) that eco-tourism analysts assume are the main drawing cards to the reserve. Divide the total park income by five (to give each of the Big Five its due), divide one-fifth of the income by the number of lions in the park, and you get a nonconsumptive use value for the lion. That's a new way that economics is trying to give financial value to existence values. While it's a beginning, "nonconsumptive use value" cannot yet account for the lilac-breasted roller which the couple from Indiana had never heard of and whose flight pattern and iridescence made their day.

The third phrase you'll be hearing a lot of is "option value" — the value of some species that may become economically profitable in the future. Option values are cornerstones of the pharmaceutical, agricultural, fishery, forestry, and pigment industries. Miracle drugs are commonly found in "insignificant" plants. The well-known anticancer agent Vincristine, which helps cure certain childhood leukemias, was found in a Madagascar periwinkle. The immunosuppressant cyclosporin was extracted from a Norwegian fungus. Cyclosporin, in its fifth year on the market, brought in \$100 million. These drugs were found by serendipity — while searching for other qualities in the plants. Recently, the fashion company Esprit, to avoid the harsh environmental consequences of using synthetic dyes, began fabricating clothes from two genetic anomalies of cotton — one with green and the other with brown bolls. Ten years ago this eco-friendly option was not even imagined.

We do not know which animal, fungus, procaryote or plant is going to produce what cure or economic breakthrough in the future. The gene infrastructure of these organisms took billions of years to evolve. It's such a fine microchip that we can rarely fabricate it economically. When an extinc-

tion occurs, you can look at it from a purely business point of view: you're taking what might potentially be the best microchip in the business and tossing it out. What I'm trying to say is: without the *phrase* "option value," we would find it difficult to validate the *concept* — that all creatures, even those that at the moment seem useless to humans, may not be so, *and* that it is to the benefit of business to keep them from going extinct.



Esprit has developed brown and green cotton; even low-impact dyes aren't needed.



Final Mini-Lesson: **The Rebirth of Equity**

The Earth Household, to use Gary Snyder's bon mot, is now dysfunctional. We all know it. The planet is a hodgepodge of tribal Simpsons. Household management borders on well-intentioned but somewhat gratuitous gestures, often accompanied by over-amped environmental and corporate encyclicals. For instance, citizens, agencies and corporations have become obsessed by more and more gallons per mile as some kind of ecological nirvana. Forgotten, or shoved under the mental carpet, is the process: the nirvana car has been manufactured by replacing steel and iron with more and more plastics. The more plastic parts, the lighter the car; the more gallons per mile. Only a few cradle-to-grave prophets have confronted the next generation's reality: what are we going to do with these plastics when the cars become obsolete?

In contrast, the old clunky, gas-guzzling 1955 Chevy Bel Aires were heavy, all iron. When they died, they were compressed into little packets and shipped to Japan, where they were reincarnated into Toyotas. The car bodies were recycled completely and returned to the United States. We have a potential disaster looming on the horizon: where are we going to put all the vehicular solid wastes — all the petrol-saving plastics and all the safer but nonrecyclable fabric/radial tires?

During the twelfth to fifteenth centuries, the English invented Chancery courts to deal with problems not handled by common law. Chancery courts were very public courts. Their goal was equity: just, fair, and impartial qualities in decisionmaking. By natural right, not technically bound by existing laws of recovery or defense, they judged what was fair and impartial. A few of these Chancery rulings entered US civil law.

Today, Young Turk economists dip back into the past, like Picasso returned to African masks for inspiration, or Frank Lloyd Wright to Mayan vault construction to revive architecture. The new economists are leapfrogging "Chancery court equity" into the twenty-first century and trying to restore its place in Barron's *Dictionary of Business Terms*. To real-estate equity (property value in excess of debts), investment equity, and banking equity, they wish to add "intergenerational equity."

The new term insists that global economics consider the global teenagers, and other humans yet to be born. In the new Chancery Court for the Planet Earth, products will be judged by their ability to minimize materials extracted from the biosphere's crust, to maximize recycling of already-extracted resources, to consume less energy, to fit harmlessly into existing watersheds, and to discharge fewer toxics. In the lingo, intergenerational equity is a futurist time-utility.

This new style of decisionmaking is obviously fairer to coming generations who must occupy the same house. Among the new words, dying words, words under renovation, soundalikes, and mindboggling crammed into these mini-lessons, "intergenerational equity" is the most nurturing. It weaves together global accounting, the materials of the biosphere, and compassion for the young. ☺

Some hapless words are going extinct or, at least, going through a radical transformation. One of the words that I hope goes extinct is "externalities," as it is employed in economics, public or private.

Rubbish!

The material evidence of our civilization, lovingly preserved in landfill, diverges considerably from our image of ourselves. This book is full of amazing news gathered in two decades by the Tucson-based Garbage Project. The debris accumulation in Troy raised the city 4.7 feet per century. New York City has risen 6 to 30 feet since its founding. The methane generated in landfills is being used in some places as a power source, but there is relatively little actual rotting going on in landfills, and "biodegradable" products (including even fresh food) are preserved perfectly for decades.

The urban poor in Mexico City "consume proportionally more candy — pound for pound, the most expensive type of food in the city — than their more affluent neighbors." People my age may remember paper and scrap drives during World War II in America and Britain. It turns out they produced such surpluses that much of it was quietly landfilled, but the programs were kept on for "morale" reasons. In modern recycling, far the most economically lucrative yield is aluminum from beverage cans. Tires can't be landfilled; they always pop up to the top.

Environmentalists have persuaded the American public that landfill is made up of 20-30 percent fast-food packaging, 25-40 percent expanded foam, and 25-45 percent disposable diapers. ("The Disposable Diaper Myth," in *WER* #60, Fall 1988, declared in a tone of outrage that 3-4 percent of landfill was diapers.) The actual figures: 0.59-1.28 percent disposable diapers; 1 percent foam; 0.33 percent fast-food packaging. The real villains are paper (40 percent); construction debris (12 percent); and food and yard waste (7 percent). —SB



Rubbish!

(The Archaeology of Garbage)

William Rathje and Cullen Murphy, 1992; 250 pp.

\$23 (\$25.75 postpaid) from HarperCollins Publishers/Direct Mail, P. O. Box 588, Dunmore, PA 18512; 800/331-3761

New York's garbage is trucked as far away as New Mexico.

In the United States, the skillful packaging of food products cuts down markedly on the wastage of foods. Packaging and the development of a modern, corporate-driven food industry are among the most important rea-

sons why U.S. households, on average, produce fully a third less garbage than do households in Mexico City, where a higher percentage of food is bought fresh, and a larger volume of garbage inevitably results.

Annals of the Former World (John McPhee Tetralogy)

In 1978, a decade after plate tectonics theory had revolutionized geology, John McPhee began traveling across the United States "to see how the science was settling down with its new theory." With an eminent regional geologist always in tow, the road he traveled was Interstate 80. The books that have resulted are nominally about the geology along different stretches of that highway, though in explaining this grand theory, McPhee keeps the globe spinning for examples and analogies. Individually and as a series, the *Annals* make geology both accessible and exciting. These are whole earth books in the most fundamental sense.

Basin and Range begins at the Hudson River, but quickly shifts to Nevada, where the mountain-building going on now is similar to what happened in New Jersey 200 million years ago. It also contains a history of geology, beginning with Scotsman James Hutton, who in 1785 freed the science from its theological framework, launching the modern era.

In the second and third volumes, McPhee provides a counterpoint to his cheerleading for the new theory. He accompanies two geologists with serious reservations about how well plate tectonics is able to explain what has happened on their own turf. In *Suspect Terrain* covers the ground from Brooklyn to Cleveland, and (like each of the books) also explains exactly what it is that geologists do. Anita Harris has spent her career color-coding one fossil species as an aspect of the search for

oil. She is a free-speaking guide through some very complex Appalachian geology, filled with ancient rivers, glaciers, oil and coal. *Rising from the Plains* moves to Wyoming and a geologist named David Love. His pioneer mother settled in Wyoming in 1905, and McPhee intercuts rocky explanations with her written recollections of frontier life. It's a wonderful match (a cross between *The Virginian* and Wallace Stegner) that gives this book a powerful reverence for place.

McPhee has a great instinct for just how long to hold your attention to the geologic fires. As a writer, he has always been in love with the naming of parts; with the rich language of geology, he is in hog heaven. But he knows when to cut away from high-voltage geology and ground his story in people and their histories on the land.

Assembling California goes on the short list of books to read if you want to understand this complex state. The gold that jump-started statehood came from the east, but the land came — thanks to the moving plates — out of the Pacific, as island arcs that collided and adhered to the continent. The book concludes with the recent spate of severe earthquakes. It let me see the place I call home with new eyes.

—Richard Nilsen

The earth is at present divided into some twenty crustal segments called plates. Plate boundaries miscellaneously run through continents, around continents, along the edges of continents, and down the middle

Deja Shoes

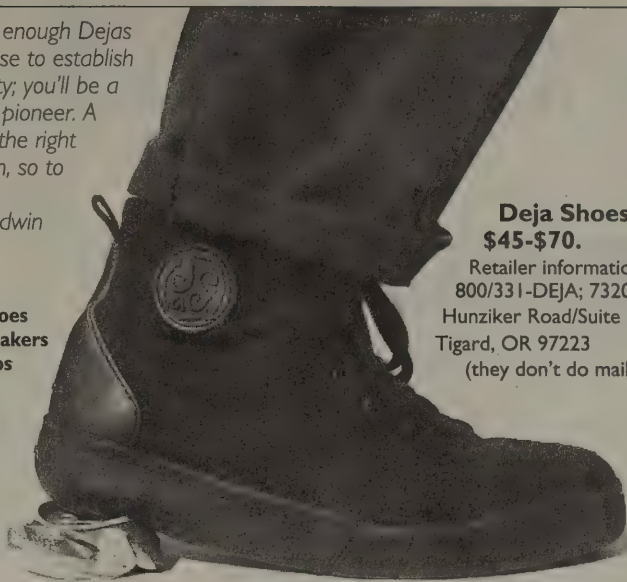
This classy-looking footgear doesn't emit a hint of the old tires, plastic pop bottles, shopping bags and coffee filters that are among the ingredients. They're among the first complex products exemplifying a better way to make things. Result: less new material and energy needed, less pollution generated, less stuff in the landfill, and a lively new company. You can even send worn-out Dejas back (in the recycled box they came in) for recycling.

The shoes seem to be decently engineered, with soles that offer extraordinary traction on sidewalks and rocks, resist mud-collecting, and don't mark floors. There are men's and women's models. Fit is good on most medium-width feet. Construction appears stout,

but not enough Dejas are in use to establish durability; you'll be a bit of a pioneer. A step in the right direction, so to speak.

—J. Baldwin

Deja Shoes Eco Sneakers (hightops shown).



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Hunziker Road/Suite 305,
Tigard, OR 97223
(they don't do mail order).

of oceans. The plates are thin and rigid, like pieces of eggshell. In miles, sixty deep by five thousand by eight thousand are the dimensions of the Pacific Plate. "Pacific Plate" is not synonymous with "Pacific Ocean," which wholly or partly covers ten other plates. There are virtually no landmasses associated with some plates — the Cocos Plate, the Nazca Plate. Some plates are almost entirely land — the Arabian Plate, the Iran Plate, the (heaven help us) China Plate.

• If by some fiat I had to restrict all this writing to one sentence, this is the one I would choose: The summit of Mt. Everest is marine limestone. —*Basin and Range*

• In the deformed, sedimentary Appalachians, the rock not only had been compressed like a carpet shoved across a floor but in places had been squeezed and shoved until the folds tumbled forward into recumbent positions. Some folds had broken. . . . Whole sequences might suddenly be upside down, or repeat themselves, or stand on end reading backwards. Among such rocks, time moves in and out and up and down as well as by.

"It's a real schlemazel," Anita said. "Not by accident is geology called geology. It's named for Gaea, the daughter of Chaos." —*In Suspect Terrain*

• Plate-tectonic theorists pondering the Rockies have been more than a little inconvenienced by the great distances that separate the mountains from the nearest plate boundaries, where mountains theoretically are built. The question to which all other questions lead is, What could have hit the continent with force enough to drive the overthrust and cause the foreland mountains to rise? In the absence of a colliding continent — playing the role that Europe and Africa are said to have played in the making of the Appalachians — theorists have lately turned to the concept of exotic terrains: island arcs like Japan slamming up against the North American mainland one after another, accreting what are now the far western states, and erecting in the course of these collisions the evidential mountains. —*Rising From the Plains*

• The mid-ocean ridges run around the world very much like the stitching on a baseball, not in simple lines but in oscillating offset segments. Such a pattern evidently accommodates a sphere. In any case, it is what the earth looks like where it is pulling itself apart. The ocean ridges of the world jump from rift valley to transform fault to rift valley to transform fault, everywhere they go. The rift valleys are typically

about forty miles long, and are offset, also about forty miles, by the transform faults.

• "Southern Florida is a piece of Africa which was left behind when the Atlantic opened up."

"People in Florida say that southern Florida is Northern and northern Florida is Southern."

"Civilization reflects geology."

Southeastern Staten Island is a piece of Europe glued to an ophiolite from the northwest lapetus floor. Nova Scotia is European, and so is southeastern Newfoundland. Boston is African. The north of Ireland is American. The northwest Highlands of Scotland are American. So is much of Norway. —*Assembling California*

Annals of the Former World

(Four-volume series)

\$55.70 postpaid.

Basin and Range

John McPhee.

Farrar, Straus and Giroux, 1981; 216 pp.

\$8.95 (\$10.95 postpaid)

In Suspect Terrain

John McPhee. F, S & G, 1983; 210 pp.

\$11 (\$13 postpaid)

Rising From the Plains

John McPhee. F, S & G, 1986; 224 pp.

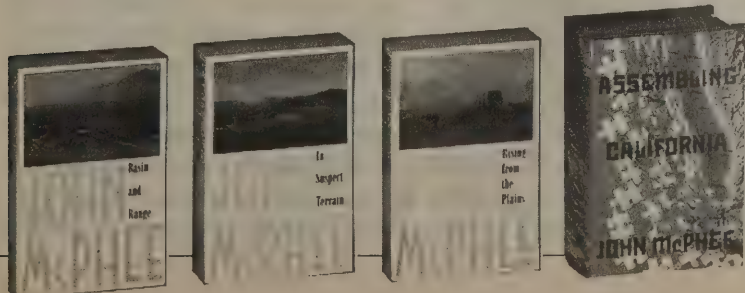
\$9 (\$11 postpaid)

Assembling California

John McPhee. F, S & G, 1993; 303 pp.

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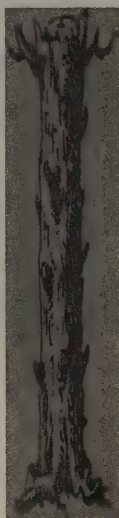
Chipko Revisited

The original tree-huggers
build a perpetual structure
for village-based forest preservation

TEXT AND PHOTOS BY BRIAN NELSON



Kalawati Devi with her son, Balbir.



I WATCH KALAWATI DEVI weave her way skillfully down the steep and well-worn path with a surefooted ease that comes only from a lifetime in the mountains. She is followed by a small boy in rubber boots who keeps pace close behind. We meet on the front step of a small hut that clings delicately to the mountainside, overlooking the Alaknanda River gorge, as the bright sun lights up the sky and transforms the river below into a glittering ribbon bending around steep, rocky cliffs. For me, it is a setting of breathtaking Himalayan beauty, an image I'll probably remember for the rest of my life. For Kalawati, it is virtually the only landscape she has ever known.

We Americans have been arguing about forestry — what trees to cut, which ones to save, and who decides — for so long that the state of our art has become inertia. The northern Indian villagers in this story have their backs up against an even bigger wall — the Himalayas. In this steep countryside, forest preservation is a matter of life and death: cut the trees down and when it rains, the bare mountain will fall on your house.

The tree-hugging direct actions that stayed the loggers' axes took place in the 1970s; an article about those struggles appeared in these pages in the fall of 1981 (CQ #31, p. 62). A dozen years later, and the Chipkos have moved beyond confrontations to the real work of watershed restoration. Backs and shovels are the tools, hands-on forest management and tree-planting are the techniques, and community-based local control is the reason for this movement's staying power. This is restoration without backhoes. Is there anything here that we high-tech types could learn from?

Brian Nelson is a writer and world traveler who lives in Toronto.

—Richard Nilsen

Our introductions are brief and casual. Kalawati offers a sharp, clever smile that puts me immediately at ease. Her eyes and hair are black, contrasting against the rich reds and greens of her sari, and her forehead is adorned with the customary red dot. Only the roughness of her hand gives away the fact that her days are filled with long hours of hard, physical work. As we talk she seems to radiate a quiet, unassuming confidence, like someone who is at peace with herself and everyone around her. Her son, Balbir, sits quietly out of deference to his mother, patiently containing his twelve-year-old urge to go out and play.

Kalawati Devi is one of the leaders of Chipko Andolan, the famous people's movement of the India's Garhwal Hills, centred deep in the foothills of the Himalaya. Chipko, which means "to embrace," got its name in the 1970s from the then-novel practice of tree-hugging: when the forests were threatened, usually by commercial logging interests working in concert with government forestry officials, Kalawati and her friends and neighbours would march together into the forest to put their own bodies between the axes and the trees. They would risk their

lives to protect a fragile mountain ecosystem and restore their ancient rights to the food, fuelwood, fodder, building materials they need to survive.

I've come here to learn from those like Kalawati who played a part in this drama, and to find out what has happened to the movement since those early confrontations. My contacts in New Delhi tell me that there is very little tree-hugging anymore — the battle has largely been won. At first I had difficulty believing that big-money logging interests and well-bribed government officials were somehow subdued by impoverished villagers. But on meeting Kalawati I find my cynicism beginning to fade; she seems like the kind of adversary that people with money and power might easily underestimate.

THE JOURNEY INTO THE Garhwal Hills, taking some twenty hours of bus travel from New Delhi, is visually compelling, at once beautiful and sobering. In between dramatic views of rocky cliffs and deep river valleys with snow-capped peaks off



Tree-planting, an ongoing task performed mainly by village women, is now a major focus of the Chipko movement.

in the distance, there are scenes of brutal deforestation — steep slopes stripped clean of trees and consequently gouged by landslides that deposit tonnes of rock and gravel into the valleys below. Landslides remain a constant threat along much of this route, and the worst have been known to tear whole villages from mountainsides. The journey to the Garhwal was delayed twice while workers dug through the debris of yet another landslide.

The roots of this devastation date back to the nineteenth century, when British colonial administrators ruled India with a combination of bureaucratic organization and military muscle. The British were interested in resources to feed a hungry empire, and the tall stands of primary-growth forests that blanketed much of Northern India were a treasured prize of imperialist ambition. The British fashioned a system of forest management that was designed to do the job quickly and efficiently. Forest lands, which had for centuries been owned and managed communally by indigenous villagers, were simply taken

over by the colonial administration, which then awarded concessions to private logging companies to extract the trees. The concept of “environmental protection” meant little to colonists who saw themselves as conquerors and developers of a wild and uncivilized land. The notion of “the rights of indigenous peoples” meant even less. And when India gained independence in 1947, the new government simply took a page from the colonial book on resource development and adapted essentially the same system.

For a long time, all of this meant very little to the people of the Garhwal Hills. Life carried on as usual in this rugged and remote area that was largely inaccessible to logging interests. But major roadbuilding programs launched in the 1960s changed all that. New roads pierced into the region; for the first time, century-old forests were within striking distance of axes, chainsaws, and logging trucks.

Within a few short years, vast tracts of forest were clearcut and mountainsides were stripped clean, marking the be-

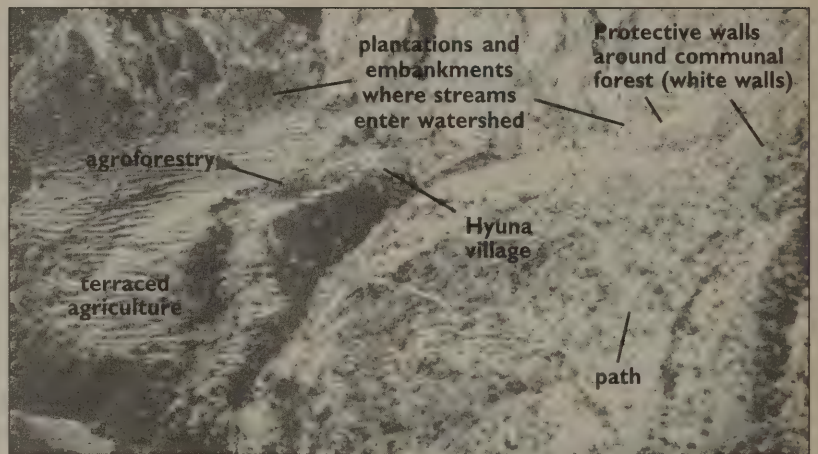
ginning of an environmental and economic disaster. The crucial protective tree cover was destroyed. Winds and monsoon rains ripped away at the thin soils; landslides became more frequent and more treacherous. With fewer trees to hold the soil and less soil to absorb the seasonal rains, the region began to swing between two increasingly dangerous extremes—chronic water shortages in the dry season and severe flooding during the monsoons. In July of 1970, floods along the Alaknanda caused the greatest devastation in living memory. Bridges, roads, houses, farms, and livestock were washed away in the deluge; nearly 200 people died.

The deforestation changed everything for the Garhwali people — their daily routines and their prospects for survival. While virtually holding the mountainsides together, trees also serve as the foundation for an entire village economy. Trees are the source of fuelwood for cooking and heating,



lumber for building materials and farm implements, fodder for livestock, and nuts and fruit to supplement the local diet or to sell in area markets. As the forests shrank, the daily task of collecting fuelwood and fodder, traditionally the sole responsibility of women, became a grueling sixteen-hour journey with increasingly meagre results. Water shortages and soil erosion devastated local agriculture. Poverty, sickness, and malnutrition became a reality in all but the most prosperous and fortunate villages.

The systematic deforestation continued unabated until the first sparks of a protest movement were ignited. Frustration had been simmering throughout the area for some time, but the single incident that brought matters to a boil occurred in 1973: The State Forest Department refused the villagers' request to cut twelve ash trees to make implements, while simultaneously granting permission to a sporting goods company from the south of India to cut thirty-two ash trees to make tennis



Hyuna Village (the small cluster of buildings in the centre of this photograph) is typical of the villages that are part of the Chipko movement. Since the mid-eighties, the people of Hyuna have launched several projects to restore their damaged "micro-watershed." These include:

- constructing embankments and planting trees at points where streams enter the valley (these points are particularly vulnerable to landslides and heavy erosion);
- restoring and rebuilding agricultural terraces;

- introducing agroforestry, based on combining citrus trees with grain and vegetable crops, in the area immediately below the village;

- building stone walls around a communal forest plantation area so that domestic animals cannot destroy seedlings;

- planting trees in the communal forest, and managing the new forest for long-term sustainability.

Through villagers' efforts in similar micro-watersheds throughout the region, a major section of the Alaknanda River watershed is being restored.

A contractor offered 1,000 rupees (about \$60, a considerable sum to the villagers) if the women would get out of the way. "One thousand rupees are not necessary," Kalawati told him. "The trees are necessary."

racquets. In a provocative and symbolic move, government officials had literally put sporting goods before ploughs, and the interests of outside businesses before the needs of local people.

It was during the meetings that followed that the villagers hit upon the notion of tree-hugging. The idea was put to the test in the forest where the designated ash trees were located; after a series of confrontations, the government and its contractor finally backed down. "Forest runners" were then dispatched to spread the news of this successful encounter from village to village. A peaceful movement to preserve basic rights was being born and village women, the traditional managers of the forests, were about to take the lead.

Kalawati recalls those early days. She talks quickly amid sparks of laughter and frequent flashes of her smile. I get the feeling that these stories have become a kind of contemporary chapter in the timeless mountain folklore.

One of her stories sticks in my mind as a particularly telling example of Garhwal forest politics: A private contractor started cutting trees in an area of supposedly "reserved" forest close to Baccher, Kalawati's home, a village of 100 families. Word of the tactics of passive resistance had spread throughout the region by then, and Baccher was ready to respond. Village women marched into the forest to confront the loggers, hugged the trees and tried to grab the axes. Kalawati recalls how she was afraid, and I can only imagine how she felt as a precedent-setting activist, risking her

life and never knowing if these confrontations would end in disaster. She was also challenging the norms of traditional Garhwal society; the village men were often slow to accept this new wave of radicalism led by women. Kalawati's husband resisted the idea at first, but (she smiles at this point in the story) he eventually learned to like the idea and now does all he can do to help.

The forest contractor, no doubt perturbed by crowds of women standing in the way of progress, tried to buy the movement off. He offered 1,000 rupees (about \$60, a considerable sum to the villagers) if the women would get out of the way. "One thousand rupees are not necessary," Kalawati told him. "The trees are necessary."

The cutting stopped — for a while — but then started again. This time Kalawati and her friends went to the District Forest Office in the main town of Gopeshwar. The official there told them, in the indifferent tone of someone who did not yet understand the significance of what was happening, that the forests belong to the govern-

Two men from Tangsha Village survey their handiwork — a stone wall that demarcates common village land and prevents domestic animals from destroying seedlings and young trees.



ment, not to a bunch of village women, and that police would be dispatched if this tree-hugging did not stop immediately. Unimpressed, the women refused to back down; they left word that any police intervention would simply be greeted by even more protesters.

At that point a ranking officer of the State Forest Department decided that he had heard enough. It was time to settle the matter once and for all. He and his entourage went into the forest to lay down the law, but instead witnessed a sight that was both fascinating and disarming: hundreds of women, more than he could count, milling about among the trees, singing songs and chanting, many with infants strapped to their waists and children at their feet. Realizing that to lay down the law would require some kind of brutal offensive against all of the women and children in the area, he left chastised and embarrassed. Kalawati (now smiling more than ever) recalls how he then attempted to sneak out the back entrance to the forest in a futile effort to escape without being seen.

THE MOVEMENT ACHIEVED similar victories throughout the 1970s and early 1980s, leading eventually to commercial logging bans throughout much of the region. Spontaneous protest has since matured into a remarkable system of village-based forest management. Some fifty villages, ranging in size from about twenty to one hundred families each, participate with persistence, determination and a talent for

cooperative organization well-honed by years of nonviolent resistance.

Each village has a women's group — a *mahila mandal dal* — that functions as the system's driving force and organizational glue. The daily chore of gathering enough fuelwood and fodder to meet immediate needs has expanded to include the subtle balancing act of simultaneously using and rehabilitating a damaged woodland ecology. Each village also has at least one area of communal forest; in some cases, these common lands include mature stands of hardwood trees, pockets of primary-growth forest that escaped the clearcutting. More often the communal forest started as a barren, logged-out patch of mountainside, and is now an area of brush, grass, and small trees in the process of restoration.

It is the job of the *mahila mandal dal* to replant and maintain these communal lands for the benefit of the entire village, now and in the future. To this end, the women work out equitable arrangements for distributing both the products of the forest and the labour for tree-planting. In the village of Papiyana, for example, each of about thirty families is allotted one day per month to cut all the fuelwood and fodder they can carry, provided that only branches and deadwood are taken and no tree is felled. Each family also devotes a day each month to tree-planting and guarding the communal forest from stray domestic animals and other unwanted intruders.

Trees are sometimes cut selectively, but only when special needs arise. Weddings, for example, rank high on the list of village celebrations and typically call for a large feast. A tree may be cut to provide fuel for the feast and a small stockpile for the newlyweds. Trees may also be cut when it is time for one of the villagers to build a new house or to fashion new farm implements. In all cases, a request is made of the *mahila mandal dal* and, if granted, is limited to a fixed number of carefully chosen and marked trees. Since everyone is well aware of the importance of the forests and respectful of the dan-

gers of overcutting, these simple rules are rarely broken. But if they are, a stiff fine is levied against the perpetrator and retained by the *mahila mandal dal* to support village projects or assist in times of emergency.

The system of women's organizations has worked well, so well in fact that it has enhanced an entire way of life. Now everyone is involved in the process of rejuvenating the hillsides. It is not uncommon to see groups of men building stone walls to enclose and protect the common forest lands, and many of the *mahila mandal dal* are now applying their organizational skills to address health care, education, and other village needs.

Watching the women at work in the forest, one comes closest to appreciating what Chipko is all about. They work together, chattering constantly

and moving with agile quickness up and down the steep slopes. Everyone has an intimate understanding of ecology, of what it takes to make things grow and why the whole effort is worth so much care and attention. They select seeds from the mature forests, grow their own seedlings, and plant trees on all but the steepest slopes. The women are close to the trees, the mountain soil, the ice-cold springs and fresh air, in ways that I can hardly understand; the whole process takes on an intensely natural, even spiritual quality. Tree-planting up here is not just a job or a hobby; it is a basic act of restoring nature and community that touches the life of every villager. Interestingly, village children follow the women along, helping and learning in their immense Himalayan classroom. A twelve-year-old child like Kalawati's son Balbir, for example, already knows enough prac-

Trees and Man

The author is a French medieval historian and working environmentalist; the subject is the forest of the Middle Ages in France. Biologically precise, economically detailed, this is an account of the way forestry was lived as a practice when Europe was young and our myths were forming. "Sustainability" is no radical, modern, or wild-native idea. It is the way our civilization used to do things. We used to be a forest people. —SB

■ The forest was quite often sparse and penetrable not because it was, as some of today's woods, maintained by rangers, but as a consequence of the pasturing of pigs and cattle in the underwood. This also resulted from the traffic created by all the people who came into the forest to hunt, fish, pick berries or mushrooms, and feed their animals. The pigs found acorns, the sheep found grass, and the goats attacked the leaves and smaller branches of the trees when they didn't like the undergrowth.

■ In the east of France, very old customs required that a man shout three times before cutting wood in a forbidden part of the forest. If, after loading the wood on his back, he managed to get out of the forest without being caught by the guard, or even if, when he saw the guard, he managed to

throw his axe beyond the ditch marking the boundary of the area, the man was not liable to a fine nor to the seizure of his tool (custom of Grendelbruch, near Obernai). Cutting green wood was sometimes severely punished. Thus in Ribeauville, according to a record of the fourteenth century, a charcoal burner caught by the forest guards while cutting green wood either had to pay a heavy fine or have his thumb cut off, (after binding it with a strap the law specified, to prevent loss of blood).



Trees and Man

(The Forest in the Middle Ages)

Roland Bechmann, 1990;

translated by Kathryn Dunham. 326 pp.

OUT OF PRINT. Paragon House,
90 5th Avenue, New York, NY 10011;
800/727-2466



Trees have been planted on terraced farmland as part of an effort to introduce agroforestry throughout the Garhwal Hills.

The dark (green) patch in the background, next to the town of Gopeshwar, is one of the few remaining tracts of primary forest in an otherwise denuded area. It was defended through nonviolent resistance by the Chipko movement in the seventies and early eighties.

tical ecology to fill many schoolbooks, a sign that bodes well for the movement's future prospects.

It was while watching the women working in the communal forest that I asked an innocent but dumb question. Somewhat mesmerized by the villagers' relentless ability to participate together, share the workload, allocate scarce resources, make decisions by consensus, and reveal no apparent signs of the greed and ambition that tear apart so many societies, I asked one of the women if they ever face serious conflicts, or otherwise fail to cooperate.

She looked at me, barely able to comprehend what I was talking about, and replied "No. This is a peace movement."

IT IS DIFFICULT TO FIND OUT who started Chipko, or who is in charge of the movement today. There are no formal titles, no board of directors, not even any business cards. No one in the Garhwal will claim any personal credit for something they all share.

There is one individual, however,

whose name is mentioned at least once in every conversation about Chipko. He is the consistent presence, the overall coordinator if there is one. Chandi Prasad Bhatt is a tall, bearded man with penetrating blue eyes and deliberate mannerisms. He is one of those rare individuals who, though remarkably gentle, somehow leaves a deep and indelible impression on everyone he meets. He exudes a kind of controlled inner energy that is difficult to describe but easy to feel.

Spontaneous protest has since matured into a remarkable system of village-based forest management. Each village has a women's group — a mahila mandal dal — that functions as the system's driving force and organizational glue.

Chandi Prasad Bhatt leads a small volunteer organization known as Dasholi GramSwarajya Mandal (DGSM), which translates loosely to "Village Self-Help Organization." The DGSM is housed in a whitewashed building on Gopeshwar's main street. Inside is a meeting room decorated with rows of black-and-white photographs depicting recent events in Garhwali history. One picture shows some of the devastation from the floods of 1970; another portrays a dozen village women meeting with former Prime Minister Indira Gandhi to receive an award of recognition. One of them is Kalawati Devi.

Chandi Prasad and the four or five people who work most closely with

him provide a focal point for the villages involved in Chipko. They visit the villages regularly and often help out when villagers have a problem that involves, for example, specialized technical know-how or negotiations with senior government agencies. Several times each year, they organize an "eco-development camp": villagers gather from all over the region to exchange ideas, learn, build solidarity, and plant more trees.

On two occasions I joined in meetings with Chandi Prasad Bhatt; both times our conversations started at dusk and carried on well into the night. We sat in his simple meeting room, lighting candles to ward off the coming dark-

ness. To make a point, he would often draw a simple map on my notepad; in this way I learned something about how the pieces of the Chipko puzzle fit together. One time he sketched three or four crooked lines, representing the Alaknanda River and some of its main tributaries, along with some small circles to mark the locations of participating villages. He explained how each village is orchestrating the restoration of a micro-watershed through tree-planting, contour farming, agroforestry, and the construction of retaining walls in the spots most vulnerable to landslides. Together, the fifty-odd villages are rebuilding a major section of the Alaknanda River watershed. With no resources other than

Beyond the Beauty Strip

"Beauty strip" is Maine loggers' slang for a strip of trees along a road or stream that screens clearcuts from the public view. Mitch Lansky takes us through the beauty strip to view the ecological and social devastation created by the paper and timber companies that own 96 percent of Maine's timberlands. This book is the opening salvo of a national fight to end logging abuses on private lands — where 85 percent of all logging takes place. As the old saying has it: "As Maine goes, so goes the nation."

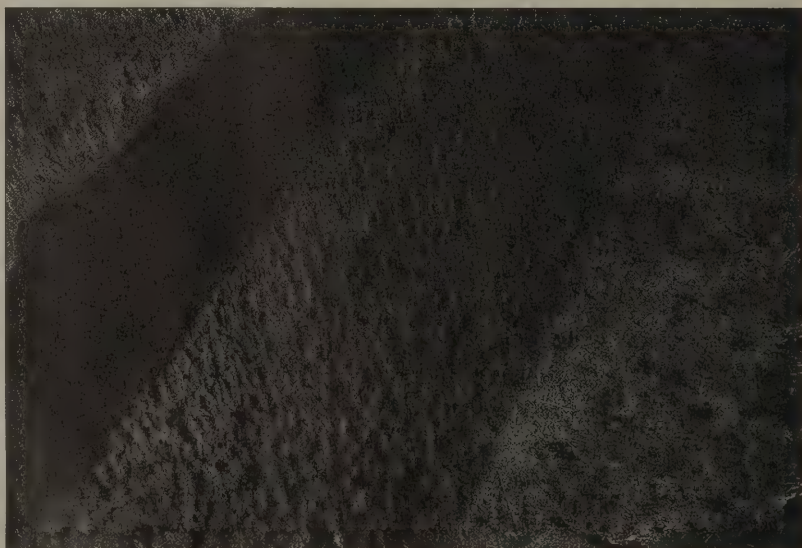
A scathing critique of industrial forestry, the book might well have been titled "How paper companies reduced Maine to a wholly owned subsidiary where they freely destroy forests; extirpate species; evade taxes; and use elected officials, regulators, scientists and the media as pimps and whores, while the citizens cheer them on." This shit doesn't "just happen," it is planned and orchestrated by industrial management of public opinion, politicians, scientists, tax codes, and of our language and metaphors.

Lansky takes 130 fraudulent industrial forestry myths and explodes them in short, excellently documented essays. Myths such as: whatever industry does in pursuit of growth and profit is good for the forest and society; deforestation increases biodiversity; tree-burning power plants are "alternative energy" projects; spraying poison everywhere is benign;

tax evasion is sound public policy. The book includes sixty pages of sources for more information, appendices and comprehensive indexes.

For a rural activist to turn over the rock and expose the creepy-crawlies that control his state is a very brave act. Lansky has demonstrated a lot of old-fashioned bravery by writing this book.
—Jim Britell

■ The simpler stand structures of plantations makes them far more susceptible to catastrophic loss than a diverse, natural forest. In some ways, forest monocultures are more vulnerable to pests than agricultural monocultures. Agricultural crops are often quite different from surrounding vegetation and must be recolonized by pests each time a new crop is planted. Plantations, however, are often surrounded by forests with similar types of trees. These trees may harbor potential pests.



A beauty strip along the Allagash.

their own skills and determination, the Garhwali people are restoring a large and badly damaged ecosystem — no small feat considering that all over the world today, huge government agencies with teams of “experts,” big budgets, and stacks of studies have been stymied by similar challenges.

Chandi Prasad Bhatt patiently answered my many questions as I groped for an understanding of what makes Chipko work. He outlined a simple but profound philosophy: The villagers act when they are ready to act, according to their own felt needs and their own priorities. They work with what they have at hand, and waste no time waiting for aid or answers from the powerful cities of India, let alone the West.

This is a movement about village self-reliance and self-determination, about an unwavering confidence in the innate wisdom and capabilities of the Garhwali people. And it is a movement about the basic rights of people to use and manage the resources they need for survival.

AS HER STORY of tree-hugging comes to a close, Kalawati Devi offers me a tour of Baccher, and I accept eagerly. We walk together up the path and into a small village square shaded by massive, century-old oak trees. People begin to gather around, eager to show their hospitality.

There is a small post office, indicative of Baccher's status as one of the larger villages in the Garhwal. It has the same neat and

orderly appearance that distinguishes all of the buildings in the village centre and is run by a tall, imposing postmaster who beams with pride and delivers a powerful handshake. Two men building a fence nod their greetings without breaking the rhythm of their work. A woman shows me her cows and explains, in the patient tone of a farmer to an obvious urbanite, how milk production has improved steadily with the increased availability of fodder. Not far away, boys play an intense cricket match on a pitch they have somehow squeezed onto a narrow mountain terrace.

Back in the village square, we talk over cups of sweet tea and fresh oranges from the village plantation. After a time that seems much too short, we say our goodbyes. ☺

While the plantation may provide an ideal habitat for pests, it may not provide sufficient habitat, or adequate alternate hosts, for predators and parasites of the pests. Young plantations lack the deep-crowned, hollow, or dead trees that shelter numerous bird and invertebrate species — ranging from woodpeckers to spiders — that feed on insect pests. Since trees, as opposed to annual farm crops, take many years to mature, pests have plenty of time to find the concentrated food supply plantations offer and to build to epidemic proportions. This double whammy — resource concentration and lack of natural controls — has led to plantation problems worldwide.



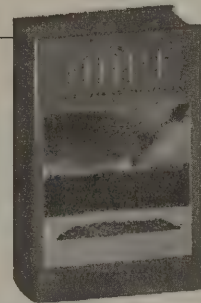
Beyond the Beauty Strip
(Saving What's Left of Our Forests)
Mitch Lansky, 1992; 453 pp.

\$19.95 (\$21.95 postpaid) from Tilbury House Publishers/Order Dept., 132 Water Street, Gardiner, ME 04345; 207/582-1899

Forests

I strolled into this book one day and didn't come out for weeks. Like the forest it evokes — “the shadow of civilization” — it is subtle, dark, and changing. No less than a narrative history of Western thought emerges. Lit. crit. meets the woods! What a lasting delight. —SB

• What we sometimes fail to understand, and what critics of the royal hunting privilege refused to accept, is that an essential dimension of the king's personhood belonged to the forest. The wilderness beyond the walls of his court belonged every bit as much to his nature as the civilized world within those same walls. In that wilderness the king avidly pursues the fugitive deer in a chase that takes on the character of a sacred ritual. The hunt ritualizes and reaffirms the king's ancient nature as civilizer and conqueror of the land. His forests are sanctuaries where the royal chase may reenact, in a purely symbolic way, the historical conquest of the wilderness. The king cannot be deprived of this symbolism for it belongs to his nature as well as his sovereignty. The king embodies and represents in his person the civilizing force of history, but by the same token he harbors in his sovereignty a savagery that is greater and more powerful than the wilderness itself. Had he not this more primordial nature he could be neither the protector nor the ruler of his kingdom. As sovereign of the land, the king overcomes the wilderness because he is the wildest of all by nature. A double nature, therefore, links the king to the forest no less than to the court.



Forests
(The Shadow of Civilization)

Robert Pogue Harrison, 1992; 288 pp.

\$12.95 (\$15.95 postpaid) from University of Chicago Press, 11030 S. Langley Avenue, Chicago, IL 60628; 800/621-2736

• William [the Conqueror]'s passion for conquest was surpassed only by his passion for the hunt. “He loved the stags as much / as if he were their father,” we read in a poem from the *Peterborough Chronicle*. William's passion was such that he afforested vast regions of the country *ubicumque eam habere voluit*, wherever he so pleased. Entire villages were demolished and their inhabitants driven off the land when William decided to afforest the region that came to be known as the New Forest. Its name has since become ironic, for it remains to this day the oldest forest of England; yet it was appropriately named at the time, since much of it was not even wooded then.

■ Decadence begins with the loss of restraint.

Looking at Earth

The most startling image may be Landsat's 1988 panoramic firescape of Yellowstone National Park — wrapped around the cover where it can be big. As intriguing, though, is the title page, which reveals that this book combines the scientific and political connections of the Smithsonian's National Air and Space Museum with the financial and marketing resources of Ted Turner, and is sponsored in part by the Aerial Systems division of Kodak. Book publishing meets PBS in the new era of economic constraint!

The authors, geologist and geographer respectively, have organized the book by continent and generally done justice to the land and culture of each — though deserts with their transparent air are favored over cloud-obscured, humid-tropical rainforests. The text is sufficient for the interpretation of the page-size and larger space shots, and is supplemented with key maps and terrestrial photos. It goes without saying that the photos are super! (What these books are doing to me is making me want to be there. Then, once I'm there, I want to drift down closer for a while, then land.)

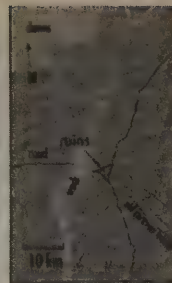
The book is satisfying in its documentation: 140-entry selected bibliography; comprehensive guide to space-based sensors (film, wavelength, resolution, etc.); and access to space-based imagery, including all those other sources: India, Hungary, Brazil. —Don Ryan



Looking at Earth

Priscilla L. Strain and Frederick C. Engle.
Turner Publishing, 1992; 304 pp.

\$39.95 (\$41.95 postpaid) from Andrews & McMeel, P. O. Box 419150, Kansas City, MO 64141; 800/826-4216



Archaeology from Space

The discovery of a lost city is an archaeologist's dream, but decades have been spent fruitlessly searching huge deserts or thick jungles for legendary sites. With remote sensing, large areas can be quickly scanned for clues.

One example of this application is the recent discovery of an ancient city in southern Oman. The site was located using images acquired from space, including Space Shuttle Radar, Landsat (left), and

SPOT. The images revealed converging tracks of old caravan routes, not visible from the ground or with conventional photography. A team of archaeologists went to Oman and found ruins where the tracks converged.

The ruins are thought to be Ubar, a lost city described by T. E. Lawrence (Lawrence of Arabia) as "the Atlantis of the sands." Archaeologists (below) excavate to confirm the existence of the city.



The World of Small

"Admire a pimple (gross)." "Peer up a nostril (really gross)." The accompanying 5X Bausch & Lomb hand lens (with protective shell) and the often-irreverent but

well-explained experiments make this book irresistible. The perfect gift for a kid you like. —J. Baldwin

Mouthparts

Pretend you are an insect dentist. Do you think you would get much business? Peer at some bug mouths. Have your patients say "ahh!"

Insects don't have teeth, but they have other mouth parts well suited for eating their favorite foods. House flies sop up slop with sponge mouths. Mosquitoes and cicadas drink through needles. Beetles and grasshoppers chomp with jagged jaws which are hidden under a flap called the **labium**.

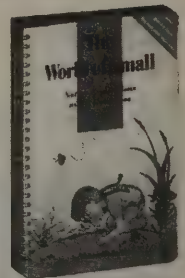
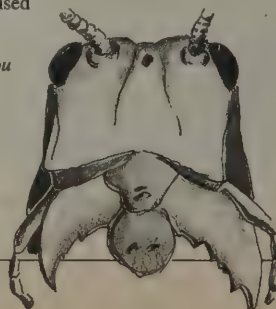
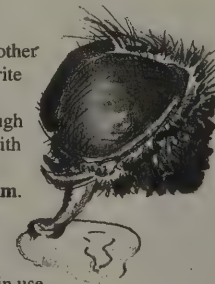


Bees and butterflies slurp through straws.

A butterfly tongue is coiled when not in use.

Pry a coiled tongue open by gently inserting a pine needle or grass stem at its center and slowly pulling outward. You may be surprised at its length.

If it's winter or you live where people don't drive cars, you can still find dead bugs on window sills, especially in messy houses. Another place to find preserved bug specimens is in spider webs.



The World of Small

(Nature Explorations with a Hand Lens)

Michael Elsohn Ross and Cary Michael Trout, 1993; 64 pp.

\$15.95 postpaid from Yosemite Association, P. O. Box 230, El Portal, CA 95318; 209/379-2648

Alternative Energy Sourcebook

With each of its seven iterations, this weighty catalog becomes more and more like a textbook written for those who would live off the grid (or on the grid with less waste and guilt). Of course the revised-for-1993 **Sourcebook** also offers the hardware you'll need (and some you probably don't). It has had its effect, just in 1990-1991, Real Goods goods have saved about 382,000 barrels of oil. Better and more essential than ever.

—J. Baldwin

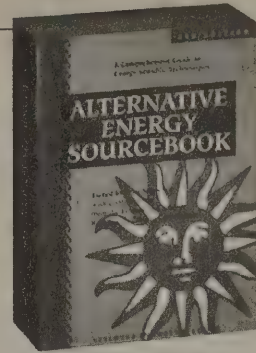
PowerStar 200 Pocket Inverter

This compact inverter quickly became our best seller. It's the best mini-inverter in the industry. It is ideal for powering most 19 inch color TVs, personal computers, drills, VCRs, guitar amplifiers, video games, stereos, and lots of other small appliances *directly from your car or 12V system*. It's great for travelers to carry in their cars to power these standard appliances. It

comes with a cigarette lighter plug that plugs into any cigarette lighter and will deliver 140 watts of 120VAC power continuously from your 12V battery. It will provide 400 peak watts and 200 watts for over 2 minutes. Amp draw at idle is 0.25 amp (3 watts). PowerStar has recently made an improvement to the 200-watt inverter. In case of overload, the unit now safely delivers as much power as it can, into that overload. One year parts and labor warranty.



27-104 PowerStar 200 Inverter \$149



Alternative Energy Sourcebook (7th Edition)

John Schaeffer, Editor. 1992; 518 pp.

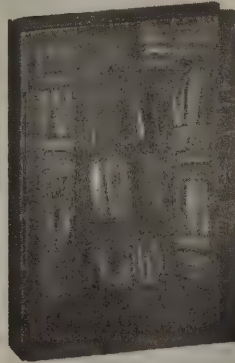
\$16 (\$20.95 postpaid) from Real Goods Trading Corporation, 966 Mazzoni Street, Ukiah, CA 95482; 800/762-7325

The Sunshine Revolution

This is the most comprehensive introduction to solar energy I've ever encountered. The handsome book is from Norway, giving a refreshing international viewpoint to US readers numbed by images tiresomely repeated in so many of

our publications. Thorough and easily understood, it should be especially useful to schoolteachers and others who need to be confidently knowledgeable in basic energy matters — politics and all.

—J. Baldwin

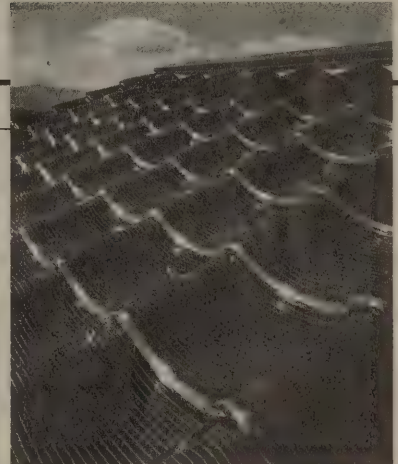


The Sunshine Revolution

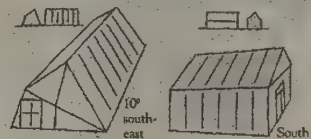
Harald N. Røstvik.
SUN-LAB Publishers,
1992; 188 pp.

\$39 (\$44.95 postpaid)
from Real Goods
Trading Corporation,
966 Mazzoni Street,
Ukiah, CA 95482;
800/762-7325

A 100kW grid-linked solar-cell array used as noise screening along the motorway in the Swiss Alps.



Japanese roof tiles producing electricity from the sun.



This illustration from the international conference on solar building technology in London in 1977 is from Vatanever's research. On the left a specially constructed solar greenhouse. The roof angle will vary with the latitude of the building site. The aim is to collect sun in the winter and to reflect it off in summer. Energy consumption is therefore reduced by roof angles and insulation to the north. On the right is a normal greenhouse. The example is taken from a cold zone in the mountains of Turkey.

Greenhouse type	8. may		23. june	
	solar	conventional	solar	conventional
Greatest plant height, cm	37	25	260	225
Average plant height, cm	30	20	228	199
Flowering plants	0	0	30	18
Total leaf area, dm ²	105	53	1873	1354
Total production, g	720	326	38320	35800
Total prod. of dry matter	53	27	4616	3482

Growth results from the two types of greenhouse in the illustration are shown in this table, as recorded by Vatanever. A double-size first harvest on 8 May is one of the results of a new greenhouse shape.

Interesting Stuff

Electric Screwdriver

Who needs one? You might. To twist a common screwdriver for a few hours is to dance in front of the sleeping tiger of Carpal Tunnel Syndrome, which is what happens when your wrist-tendon lubricators run out of lubricant, which is what happens when repeated motions use it up faster than your body can furnish it. It hurts, and it can be permanent, like "carpenter's elbow." Until recently, electric screwdrivers were only available too big and clumsy (as used by drywall installers) or too wimpy to drive (sullenly) more than a handful of screws. Black & Decker is among the manufacturers now making a driver that is both svelte and powerful, with enough in the battery to install a morning's worth of rain gutters without pooping out. It'll deconstruct equally well in reverse. An accessory kit extends capability with socket-wrench adapters and other rotatables. Can't say how long it'll last yet, but nine months of abusive ranch duty hasn't fazed it. —J. Baldwin

JB's rechargeable screwdriver appears to be a

**Black & Decker
Model 9074/SD2000**

Available — hard to avoid, even — at hardware stores everywhere.

Or call B&D for dealer information:
410/539-7730



Wood Finishing Supply Catalog

It's rare that a woodworker can just go downtown and buy most items in this well-considered selection of materials and tools for fine finishing and detailing. When was the last time you saw Rottenstone and Ground Rabbitskin Glue at K-Mart? —J. Baldwin



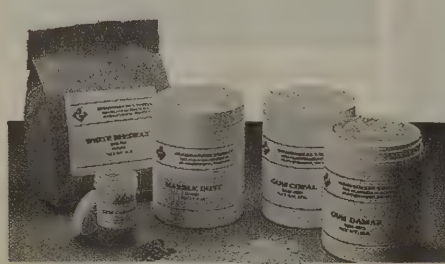
Wood Finishing Supply Catalog
Catalog free from Woodworker's Supply, Inc., 5604 Alameda Place NE, Albuquerque, NM 87113; 800/645-9292

Behlen's Water Base Urethane Finish

May be brushed or sprayed

A quick drying, clear topcoat formulated from waterborne urethanes and copolymers. It produces a finish that is mar and solvent resistant, and may be applied by brush (foam or nylon bristle) or sprayed with conventional or HVLP spray equipment. Behlen's Water Base Urethane Finish is non flammable, and environmentally friendly. Clean up is with cool water and detergent.

- 848-908 Gloss Qt.....\$11.55
- 848-915 Gloss Gal.....\$34.10
- 848-922 Satin Qt.....\$11.55
- 848-929 Satin Gal.....\$34.10



Gum Copal

Gum Copal is a yellowish colored fossil resin that comes from Australia, the Philippines, and the West Indies. After heating, it is soluble in linseed oil and pure gum spirits turpentine. It is primarily used in the manufacture of varnishes for the furniture industry.

850-679 1 Lb.....\$12.00

Gum Damar

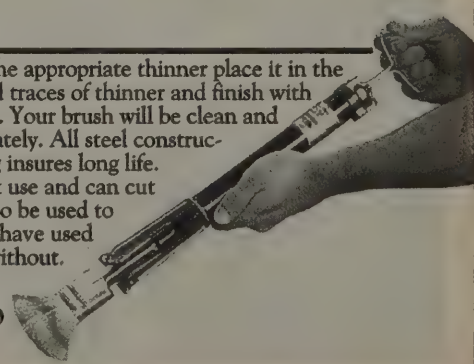
Originating in Batavia, Singapore, or the East Indies, this yellowish-white substance is used in the manufacture of varnishes, lacquers, and paints. Gum Damar is soluble in alcohol and pure gum spirits turpentine.

850-686 1 Lb.\$11.75

Brush Spinner

After rinsing your brush in the appropriate thinner place it in the brush spinner and remove all traces of thinner and finish with a high speed spinning action. Your brush will be clean and dry enough to reuse immediately. All steel construction with double ball bearing insures long life. Built to withstand consistent use and can cut cleanup time in half. Can also be used to clean rollers. A tool that we have used for years and would not be without.

850-476\$24.90



The Sanding Catalogue

You are expecting maybe forty pages of enticing color photographs of little squares of sandpaper? Well, uh, yes, sort of; the gritty paper is there in every form imaginable, but so are the devices that use it. Many of those are ingenious, of recent birth, and not apparent at your local store. Everything is described usefully. The entire selection is a welcome boon, even to experienced woodworkers. —J. Baldwin

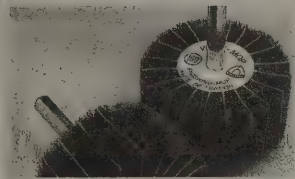
The Sanding Catalogue

Free. P. O. Box 3737, Hickory, NC 28603-3737; 800/228-0000 or 704/326-0380

Spindle-Mounted Finishing Flapwheels

New! Finishing Flapwheels For Small Parts

Brand new to the woodworking market and an exclusive of



The Sanding Catalogue, our finishing flapwheels will put a glass-smooth finish on most small parts. Whether finishing flat, rounded or slightly contoured parts you've never seen a more delicate sanding tool. Intermixed with abrasive flaps are flaps of nonwoven nylon. These make the wheel softer while also making it less aggressive. Use with any 1/4" tool.

SIZE	240 Grit	150 Grit	100 Grit	60 Grit
ITEM#	FW98073	FW98070	FW98067	FW98064
2" x 1"	8.38	8.38	8.38	8.38

Micro-Mesh Cushioned Abrasives

Get Hand-Rubbed, High-Gloss Finishes

Micro-Mesh superfine abrasives will take your finish that extra step to perfection. This kit is extremely high-tech and has been used in the aircraft and aerospace industries. It's now available to you the woodworker in grits specifically designed for wood finishing and polishing. Micro-Mesh Kits contain 18 - 3" x 6" sheets, 2 each of 9 different grades starting at 1,500 grit and going up to 12,000 grit! Abrasive grain lies in a resilient layer of material which cushions the grit during use to produce a fine, even scratch pattern. Try it to polish polyurethane, polyester, epoxy finishes, or even on bare wood for a deep luster.

ITEM #MI01010 . . \$39.00

Sandflex Abraser Block

The Sanding Catalogue is proud to offer the original Sandflex Abraser. We have found literally thousands of uses for these little wonders. Even Popular Mechanics Magazine has recognized the versatility and functionality of this product. Imbedded throughout the rubber compound are sharp abrasive grits that are constantly exposed as the block is being used. The blocks are 3" x 2" x 3/4" and fit comfortably in your hand.

Because they are somewhat flexible they can be carved to specific shapes. The rubber compound allows you to use these with water, soap, paraffin, or other fluids for an even nicer, cleaner finish.

Use on your table saw top to clean, brighten and smooth it to a silky finish, clean your tools, stainless steel sinks, ceramics, remove rust and scale, smooth out solid surfacing materials like Corian, clean cookware and



many, many more uses. Choose from three different grits; coarse, medium or fine.

No tool box or household should be without the Sandflex Abraser Block!

Coarse = ITEM# SA99999
Medium = ITEM# SA99998
Fine = ITEM# SA99997

3" x 2" x 3/4" Sandflex Abraser \$3.95 ea.

Ryobi Detail Sander

Frustratingly slow by hand, heretofore impossible by affordable machine, sanding inside corners and ledges has always been a challenge even to skilled workers. This oscillating device makes the task easy, assuming a bit of care. (Prudence suggests practicing on a scrap before assaulting the Louis XIV antique.) It's small, light, and powerful, but rather buzzy. Pre-cut, stick-on paper can be had 60, 80,

120 and 180 grit. You'll like how well it works. —J. Baldwin

Ryobi Detail Sander

\$49.95 (\$53.45 postpaid) from The Sanding Catalogue, P. O. Box 3737, Hickory, NC 28603-3737; 800/228-0000 or 704/326-0380. . . or at your local Ryobi dealer.





Traveling Shoes

I travel frequently from (usually) sunny California to less salubrious climes, often combining field work with business and pleasure. One thoroughly stuffed carry-on has to do it — no room for extra Guccis or nerdy rubbers. These lightweight leather chukka boots are both insulated and waterproof to about three inches deep, yet are passable with sportjacket and tie if you can tolerate slight overtones of Mickey in the available (huzzah!) Size Wide. Long-hike comfy except in the tropics. In black or brown. —J. Baldwin

Timberland Waterproof Chukkas

\$110

Call Timberland for your nearest retailer: 603/926-1600

Burrito Suiter

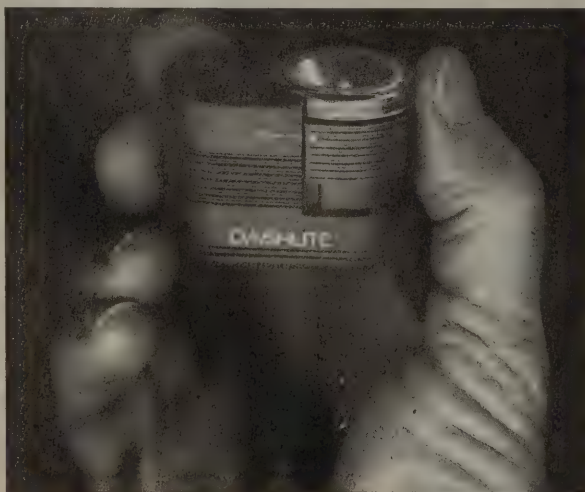
Last one on the plane with a garment bag loses — the hangup and overhead space (if any, on smaller planes) is taken. And you know what can happen to an innocent suitbag in the cargo hold . . . Unlike most, this sturdy, clever design bends willingly in two places, enabling it to fit easily in the overseat bin, or even under-seat with a bit of pummeling. Accompanying the 47" x 21" x 4-1/2" (open) main compartment are five zippered pockets — one waterproof, for sequestering the wet, dirty and smelly. Two, of see-through mesh, might hold shoes. The squared hang-up hook fits over door tops without scratching. The fat leather carry-handle can be augmented by an (optional) shoulder strap to ease the frantic sprint from gate 5 to gate 112. Straps, tiedowns, and buckles abound. This is the one. —J. Baldwin

Burrito Suiter

\$185 (\$190.50 postpaid) from Patagonia Mail Order, Inc., 1609 W. Babcock Street/P. O. Box 8900, Bozeman, MT 59715; 800/638-6464

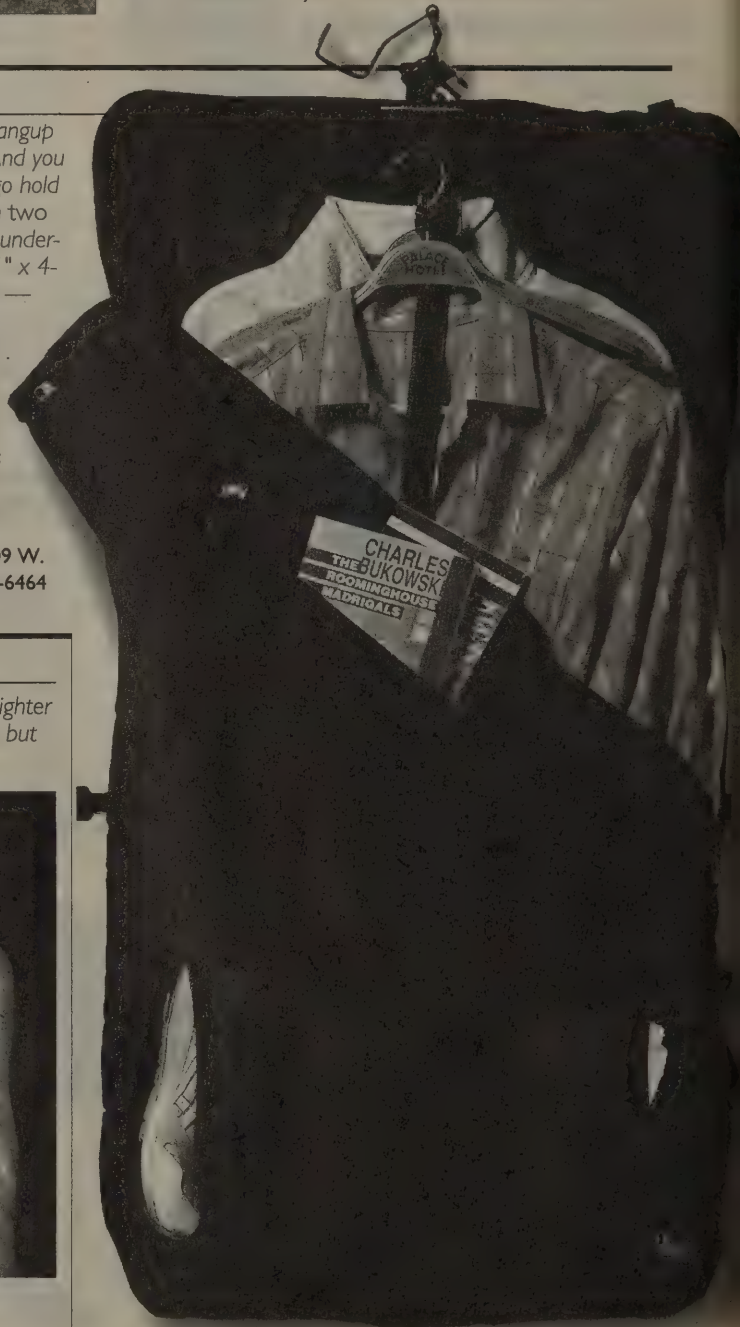
Dashlite™

This little beast lives where your now-disreputable cigar lighter used to, always ready, never in hiding. Only has one eye, but it's a bright one. —J. Baldwin



Dashlite

\$15 (\$18.85 postpaid) from Brookstone, 5 Vose Farm Road, Peterborough, NH 03458; 800/926-7000



Zipper Rescue Kit

It is fitting that a hundred years after the patenting of the zipper, someone has finally taken the time to understand



the damn things, write a repair manual, and provide the parts. Included in Canvas Mike McCabe's kit are thirty-two sliders in the four sizes most commonly used in outdoor gear. In addition, there

are six bottom stops, six top stops, a spool of thread, a curved needle, and a chunk of beeswax (for preventive maintenance). You provide the scissors and pliers.

For you zipper freaks: this kit is aimed at the repair of YKK-type mechanisms. Look at the little pull tongue on your slider. It probably says "YKK" if the gear is less than twenty-five years old. While these parts are not meant to work on brass zippers, there is enough knowhow in the manual to allow you to troubleshoot your workpants before you go to ripping and shredding.

A good, low-tech, money-saving solution to a common problem, provided by a person who has fixed thousands of zippers.
—jd smith

Zipper Rescue Kit

\$18 postpaid from McCabe Zipper Repair, P. O. Box 1213, McCall, ID 83638

All-Purpose Hand-Powered Patcher

This is the kind of technology we were looking for twenty-five years ago: a hand-powered, flywheel-driven, industrial-strength sewing machine. Those of you who have been with us since the paleosolar days of the Whole Earth Truck Store may remember Fred Richardson as the mechanic in Amish clothing who worked with Stewart in the back room, building an airplane. I confess that when I heard that Fred was importing a hand-powered sewing machine from China, my first image was of the little pink Monkey Wards device my sister used to build wardrobes for her Betsy Wetsy. But I know Fred to be a consummate tool junkie and a very careful person. So I ordered one, and have been delighted.

These machines are not toys. Just by cranking a handle I have stitched buckskin, latigo, sole bends, canvas, tractor innertubes (great rafting dry-bags); because I can slip a boot up over the free arm, I now have a way to restitch the lower rubber to the leather upper of my felt-lined pack boots, which are required fashion up here at 6,000 feet and 45° north.

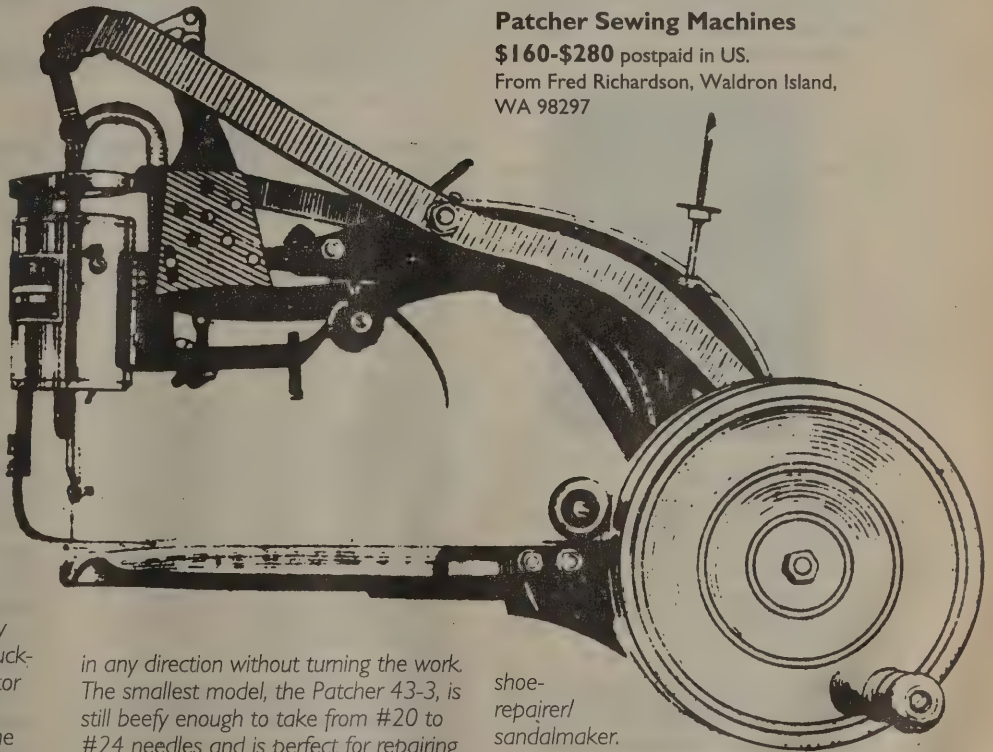
Fred imports three models. All of them feature single-needle, lockstitch, horizontal oscillating shuttle, free arm, round-shank industrial needle (Singer-type), and a barrel assembly (or universal upper feed) that allows the operator to stitch

in any direction without turning the work. The smallest model, the Patcher 43-3, is still beefy enough to take from #20 to #24 needles and is perfect for repairing whitewater gear, horse harness, motorcycle jackets, tarps, bags, nylon tow straps . . . The heavier Patcher 43-4 uses #22 to #27 needles and would easily resole a flip-flop, but, because the stitch length on all machines is adjustable from five to fifteen stitches per inch, it will do anything the 43-3 does and a little more. The post machine (43-5) has a deeper throat and uses a longer #27 needle; it would serve well the itinerant

Patcher Sewing Machines

\$160-\$280 postpaid in US.

From Fred Richardson, Waldron Island, WA 98297



shoe-repairer/
sandalmaker.

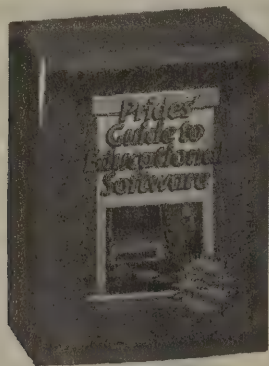
Fred has gone to considerable trouble to provide a good English-language technical manual for his machines, and he carries a complete line of replacement parts. He also imports a treadle-powered threshing machine, and cartwheels and axles. Because he runs a small operation, he requests that windowshoppers include a legal-size SASE for his pamphlet.
—jd smith

Prides' Guide to Educational Software

I see a lot of software. Most of it makes my eyes glaze. Trying out kids' stuff is the worst; I simply don't have Nintendo-mind. But I've looked at enough so-called educational software to know that the good is very good and the bad horrible. But how do I find the good stuff?

It's all here in this fat, overwhelming, comprehensive, tell-it-like-it-is book. I found all kinds of wonderful educational software I knew nothing about: language programs that work, math programs that work, physics programs that are fun, etc. This tome doesn't miss much.

The Prides have eight kids, all home-schooled. In their multi-platform computer room, the gang runs software ceaselessly. Stuff the kids learn from they rave about; Bill and Mary compare it to the other programs the kids dig, and then write it up. They don't mince words or hold back opinions in the least. The Prides are down-home conservative folks, not easily swayed by fads in learning or software. Their book is the best good news about education I've seen in years. —Kevin Kelly



Prides' Guide to Educational Software

Bill and Mary Pride, 1992; 607 pp.

\$25 (\$28.95 postpaid) from Good News/Crossways Publishers/Retail Order Dept., 1300 Crescent Street, Wheaton, IL 60187; 800/323-3890

• An industry-shaking program like Playroom is a tough act to follow, but Broderbund has done it again with its terrific new Treehouse program.

It takes at least an hour and a half just to run through each Treehouse feature once. To begin, you click on one of the possums or the tree hole. The possums climb a ladder and enter the treehouse. There you find a chalkboard, a sign telling whether it's nap time or not, a clock, a boom box, a spyglass, clouds outside the window, a bird's nest, a can of worms, an egg, a music console, a bubble blower, a bowl of fruit, a

sack of nuts, a flowerpot, a banner listing today's date, a puppet theater, a toy car and road rally map, and a cobweb. Each of these objects performs an animated routine or leads you into a new environment. Draw whatever you like on the chalkboard, with its six colors of chalk. Feed the girl possum a fruit snack, or the bird a worm. Listen to two tunes on the boom box. Click on the egg and watch a bird hatch. Blow bubbles with the bubble-blower. Change the clouds into funny shapes. Make a flower grow in the flowerpot, or a candy cane. When a trio of balloons comes floating through, pop them. Click on the calendar date to change it and find out something about a famous person born on that day.

In addition, you can learn a lot about sentences, music, animals, place value, and dollars-and-cents math with the seven included games. Click on the theater and you're in a sentence-forming game where you can create animated scenes based on a sentence of your devising or unscramble sentences — all without ever pressing a key except the mouse button. . . .

The sound is gorgeous if you have a sound card, and the graphics are beautiful. We can't find a thing to criticize. Recommended.



Broderbund Software

Treehouse, \$59.95. Ages 6-10. IBM PC family/Tandy/compatibles, 640K, EGA/ VGA/MCGA, hard drive required, supports mouse, supports Sound Blaster, Tandy 3-voice sound, and compatible sound cards. Apple II family, 128K, \$49.95. Manual-based copy protection. Available from discounters.

Concept: ♥ ♥ ♥ ♥ ♥

Usability: ♥ ♥ ♥ ♥ ♥

Education: ♥ ♥ ♥ ♥ ♥

GENERATION: (5)

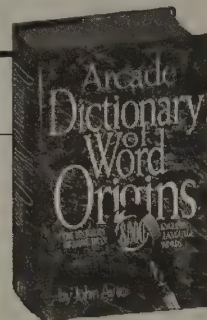
The Arcade Dictionary of Word Origins

Etymology is an often-used color on my writing palette, and I usually depend on Eric Partridge's *Origins*.

Unfortunately, Partridge is punishing; looking up a word usually involves two or three dreary, acronym-filled excursions down a chain of cross-references. Now a *London Observer* "words" columnist has compiled a list of 8,000 origins, including a sense of how the originators probably developed its meaning in Sanskrit, Germanic, Ancient Greek or Latin times. Like any really good reference book, this one compels browsing. —Art Kleiner

borrow [OE] Modern English *borrow* is a descendant of Old English *borgian*, which came from the Germanic base **borg-*. This was a variant of **berg-* (source of English *barrow* 'mound') and **burg-* (source of English *borough* and *bury*). The underlying sense of the Germanic base was 'protection, shelter,' and the development of meaning in the case of *borrow* seems to have been like this: originally, to *borrow* something from somebody was to receive it temporarily from them in return for some sort of security, which would be forfeited if the thing borrowed were not kept safe and eventually returned. Gradually, the notion of giving some sort of concrete security, such as money, weakened into a spoken pledge, which by modern times had become simply the unspoken assumption that anything that has been borrowed must by definition be returned.

▶ *barrow*, *borough*, *bury*



The Arcade Dictionary of Word Origins

(The Histories of More Than 8,000 English-Language Words)

John Ayto. Arcade Publishing, Inc., 1990; 583 pp.

\$29.95 (\$32.45 postpaid) from Little, Brown & Co./Order Dept., 200 West Street, Waltham, MA 02154; 800/343-9204

easy [12] *Easy* comes via Anglo-Norman *aise* from Old French *aisie*, the past participle of *aisier* 'put at ease,' which in turn was a derivative of *aise*. This noun (source of English *ease* [13]) originally meant 'convenience' rather than 'comfort.' It came from **adjaces*, the Vulgar Latin descendant of Latin *adjacens* 'nearby' (source of English *adjacent* and related to *adjecive*), which was the present participle of the verb *adjacere* 'lie near.' The progression of senses is thus 'nearby,' 'handy,' 'convenient,' and eventually 'comfortable.' The subsequent development to 'not difficult,' which took place in the 14th century, is purely English, although Breton took the parallel step of borrowing French *aise*, as *aes*, to mean 'not difficult.'

▶ *adjacent*, *adjective*

Echoes from readers back to *Whole Earth Review* (27 Gate Five Road, Sausalito, California 94965).

We pay \$15 for every letter we publish.

Oxygen!

The oxygen level in Biosphere 2 continued to get worse after Kevin Kelly's report ("Biosphere 2 at One" in WER # 77, Winter '92). When it showed signs of endangering the Biospherians' health and activity, an injection from the outside of 20,000 pounds of oxygen was planned. Ten tons! One of the scientific challenges of Biosphere 2 is figuring out where the hell and how the hell ten tons of oxygen got sequestered in the system. In the Biosphere 2 Conference on The WELL, biologist Linda Leigh described what that injection of oxygen felt like. —SB

Here is my personal journal entry from the day that we started to re-oxygenate the Biosphere.

P.M. — Just had one of the more remarkable experiences of my life . . . I went to an atmosphere of 14.2% O₂ to an atmosphere of 26% oxygen in less than 5 minutes.

The crew outside spent all day injecting oxygen into the west lung, at one point the entrance pipe freezing over, decisions on what measurements to make and etc. At approximately 19:50 they called on the radio that the oxygen had been injected (fire trucks were here from the county, as well as our own, I guess because of the danger of combustion) and that the door was to be opened to the west lung to let the oxygen mix into the Biosphere. The lung had been filled to an atmosphere of 26% oxygen, which is an overall addition of only 0.7% to the Biosphere when well-mixed. So off we all trooped to breathe in the lung — the sure sign of ecstasy hounds looking for their next high. Something very poetic about taking an expedition to a lung in order to breathe.

Seven of us stood by the opening of the west lung for the rush of oxygen that would come out when the door was opened, and then to enter the lung and breathe again. Didn't know exactly what to expect, but thought that perhaps there would be a rush similar to a quick

euphoria, then a drop as the adjustment was made.

It was not a major rush — it was a sense of intense well-being to breathe deeply and not feel like I needed another deep breath immediately thereafter — after a long period of what I now know is non-well-being. Before entering the lung, but several minutes after inhaling the increased O₂ charged air I got a sensation in my jaws, kind of a tiredness or a soreness as though I had been chewing a lot. Then we entered the lung tunnel, and I recalled all of the adventures that I had had in this subterranean tunnel during construction.

It was quite chilly in the lung, I suppose both because of the outside ambient temperature and the temperature of the liquid oxygen boiling coldly off into the lung. I barely noticed the people at the lung window at first. Had felt strangely hyperactive all afternoon and evening for the first time in weeks, and I got a sudden impulse to run around the lung for no conscious reason, just an impulse which drove my legs. Odd, I'm not normally prone to run. But when I returned to the groups of people I observed that I was not panting, that in fact I didn't feel at all like gasping for air, whereas just 15 minutes earlier I would have been terribly winded just walking up 20 feet of stairs slowly. I was floored with this discovery, also that my instincts told me that exercising was the way to notice the difference between 26 and 14.2% oxygen. I felt like a born-again praising the virtues of oxygen to my formerly breathless comrades; and several of them followed suit in the jog around the lung. An extraordinary experience. I felt that I had been taking my breath for granted all these years, that I never really experienced it until I lost it and then regained it once again. I'm certain that I could not have even made it all the way 'round under the low O₂ conditions that we have been "living" in. After this discovery there was much chatter and elation amongst my fellow joggers, and those on the other side of the lung window peered in delighted and relieved.

The team on the outside of the lung window, our cheering squad, looked sweeter than sweet — Yasmine, Jack, Jeff, Freddy, Norberto. I wondered "What are you all staring at?" at first. I felt strongly observed, as an organism under the cover

slip of a slide being observed for the first time ever, a new discovery, the awe and wonder of emerging life. This was the first time that I had felt observed in this way since a class of medical students visited me in the hospital in Tucson when I had falciparum malaria; they had never seen the symptoms before and I was the organism to be studied and probed.

Then I felt a strong unity and connection with the outside expeditioners, we were all on the same expedition, and then I understood that they were at once very concerned and very curious about us, and that they were all very relieved to see the impact of what they had spent their afternoon accomplishing, and they seemed somehow awed with the site of 7 Biospherians getting a good hit of oxygen finally. I felt a lot of love and comradeship from them and for them, it was overwhelming and they were sparkling.

I talked later with one of my onlooking colleagues about her impressions, and what she was thinking about from out there. She said that she saw us as an incredible group of people, each one of us equivalent to 200 people on the outside. She felt that there was so much beauty at that moment, right there. And she told me how much she loves me — I could hear the tears of passion being held back beneath the toughness of this female Berber mechanic, and remembered her strong Moroccan loveliness shining modestly through the lung's cover slip.

As we started to leave we got a radio call from Norberto that "It really is a lung!" I announced to those outside "Don't take your oxygen for granted," then noted it was directed as much toward myself as toward others. An unobtrusive reminder. I noticed an almost uncomfortable giggle from those outside, then honest consideration of what they had just witnessed and the importance of understanding that statement. I doubt that any of us ever will take our oxygen for granted again — it was a magic time, and for me it was highly emotionally charged. Breath. That which we cannot live without.

Left the lung through the tremendous tunnel, quipping about the strong feeling of well-being, the lifting of anxieties and dark clouds that we had been carrying for months, that we all felt far more vital now. Maybe my hair will stop turning grey. As we walked in file through the



basement I had a strong sense of anticipation for the physiological changes that would inevitably reverse themselves as the oxygen diffused into the total volume of the Biosphere. Could my organism really feel that good for a long period again? I felt I was gaining 10 years for each 10 steps I took away from the high O₂ area — now 50, now 60, 70 then 90 with emphysema. Then going back up the stairs — we all hesitated wondering if we would make it without the now-normal panting to get up. We were making our ascent once again, this time at a much faster pace, from 26% oxygen, below sea level, back to 14.2% oxygen, or 13,400 feet. This was in a matter of 40 vertical feet and in less than a minute contrasted to the 15 months it took us to get from 21% to 14.2%. It wasn't too bad, though I could sense some reversals occurring as I climbed. At the top of the steps I was in okay shape, though I got a return of the same jaw sensation that I had had on first breathing the high O₂, as well as a similar sensation in my lower spine.

By 20:25 I felt heavy once again, less vital, and by 20:30, less than a half hour from leaving the high O₂, I felt very heavy, with a heavy pressure above my eyes and in my forehead.

By now — 21:11 hours — I am feeling dragged out again, a really heavy feeling

in the brow and forehead which I have been so accustomed to that it is normal now. My shoulders are slumping and feel sore, and my body feels heavy. My eyes burn terribly; I have that cheery (spirit) but irritable (environment) feeling, which had vanished at 26%. Hmmm. I am really anxious to have the O₂ up to 19% once and for all, which should be by mid-next week.

Looking back now, I visualize us Biospherians being "fed" oxygen by our team on the outside, like honey pot ants hanging from their chamber ceilings being fed with honeydew by fellow worker ants. Oxygen is as much nourishment for us as honeydew for ants.

Linda Leigh
Biosphere 2 (Arizona)

Expert testimony in the case against patents

Don Lancaster's article "The Case Against Patents" [WER #77:86] didn't explain why if patents are worthless we keep reading about lone inventors being rewarded tens of millions of dollars. What about the guy who invented the slow windshield wiper? That doesn't seem that ingenious yet I think he has made a bundle. Another problem for patents is that you now have to pay a main-

tenance fee. You pay to file it then you pay every few years to keep it in effect. Much much more expensive today than 10 years ago. Then there is the wish to "harmonize" US patent law with countries such as Japan. First to file gets the rights rather than first to invent.

This first to file rule would of course not apply to published ideas or products on the market. Here the US law is wonderful. One has a year to file a patent, one need not keep work secret as in Europe or Japan, to keep rights. Let us hope this is not "harmonized" away.

Why not extend the one year grace to two years?

Why not stop raising our taxes or squander money on useless gov research in vital areas such as "alternative energy." To encourage research we could simply extend the life of patents in the field to say 25 years instead of 17. You wouldn't need to raise taxes or hire more bureaucrats.

Steve Baer
Corrales, New Mexico

The same Steve Baer who invented the Zometool (p. 64). —J. Baldwin

Swing low

Dear Mrs. Reisenloch ["One Size Does Not Fit All," #78:73],

Indeed. For a man with a large penis, there are three defining moments:

- The first time using a condom. Ouch!
- The first time you go to a porno movie, and notice that the male lead isn't very big.
- The first time you go to bed with a girl, and it doesn't fit. This is frustrating to everyone concerned. Even more frustrating is advice to "be gentle," or "use lubricant" from people who have not a clue.

It is a good thing that they're finally making condoms in size large.

dave
San Jose, California

Gender whiplash

I just wanted to drop you a note regarding the letter in Fall issue from Carolyn Haley [#76:130]. I found it a breath of fresh air. In a letter I wrote to you last

spring I mentioned my concern with some women's emphasis on differences between men and women; it was nice to see that at least one woman has some of the same concern. . . .

Why not do some research into how our sexist attitudes about men affect us? Sexist attitudes about men are subtle, pervasive and destructive, but little is said about them. It seems like an issue devoted to men is about due. I'm not talking about drumming and howling at the moon; how about stuff like why men wear boring clothes; why is it okay for men to be in combat but not women; why are men expected to be more "responsible" than women; why are the craft stores filled with women and not men; how come women that dress in men's clothes are cool but men that dress in women's clothes are laughed at and called names; why do more men want to become women than women become men; why is it almost always the woman who gets to quit her job and stay home (with or without the kids); and on and on and on . . . The men's movement has barely scratched the surface of the discrimination against men in this society.

Steve Hanrahan
Portland, Oregon

P.S. After writing the above, I read an opinion column in the paper written by a woman who said she was a feminist. In this column, she stated that she didn't think women should be allowed in combat because this would mean, by extension, that if draft was reinstated, women would be forced to fight and she, personally, didn't want to be hurt or killed in combat. She never mentioned the fact that maybe men don't want to be hurt or killed in combat either; it didn't seem to be something that could happen.

If this attitude doesn't fit the description of sexism, I don't know what would. Some women seem to want all the privileges but none of the responsibilities of equal citizenship.

Pandering to those cranky females again

Your Winter 1993 issue, with its "Biosphere 2 at One" cover story, riveted me. Your Spring 1993 issue arrived less than a month later; it was discouraging, even offensive, with its politically correct

woman-as-victim-of-our-femininity and men-are-cockroaches editorial line.

Fully 58 percent of this issue is largely irrelevant — even downright hostile — to men. Based on the above percentage, a significant chunk of my subscription is devoted to the sisterhood, helping to finance the production of topics that, at best, pander to a single constituency and, at worst, assail men solely because of a birth accident. You've devoted considerable space to this subject before, and I want to know: where is the fairness?

You get a D- for this issue. If one more anti-man polemical *WER* harangue lands in my mailbox, I'm bailing out. I don't see any reason to pay for subject matter that is no better than boring and usually insulting; I can walk the streets and be insulted for free! This hackneyed drivel sounds just like the guilt-ridden mainstream press. *WER* as *Time* or *Newsweek* or *Forbes*?

Dale Kemery
Wheeling, Illinois

"People deserve to hear both sides"?

I was very disappointed to see you publish a silly piece of ignorant claptrap like Joe McConnell's "Firearms: No Right is an Island" in your Winter '92 issue [p. 40]. The reader, after completing this article, would never know that many of the issues discussed by McConnell have been studied carefully by expert lawyers and social scientists. And their conclusions don't always agree with McConnell.

Let's take the constitutional issue. Mr. McConnell seems to believe that gun control "chips away at the Constitution." But, imitating the NRA, he doesn't bother to state the FULL text of the 2nd amendment, which says "A well-regulated Militia, being necessary to the security of a free State, the right of the people to keep and bear arms shall not be infringed." As Laurence Tribe, possibly the US's greatest constitutional commentator alive today, has said, ". . . those words most plausibly may be read to preserve a power of the state militias against abolition by the federal government, not the asserted right of individuals to possess all manner of lethal weapons."¹ The higher courts have agreed: there are thousands of gun control laws on the books today,

from registration to waiting periods to outright bans on some classes of weapons, yet not ONE has ever been overturned by the Supreme Court on 2nd amendment grounds. As former Chief Justice Warren Burger said on the MacNeil/Lehrer newshour on December 16, 1991, "They [the NRA] have misled the American people."

Now let's look at the effectiveness issue. We are blithely assured by Mr. McConnell that "objects are not amenable to control by laws." Yet some studies say otherwise. Consider Massachusetts' Bartley-Fox law, which required, among other things, an identification card for firearms owners and a mandatory one-year sentence for carrying an unlicensed handgun. Deutsch and Alt, in a 1977 study² found that the law decreased armed robbery and gun assault. Loftin et al.³ found that Washington, DC's law (which banned possession of handguns) coincided with an abrupt drop in both homicides and suicides by firearms.

Mr. McConnell tries to draw an analogy of guns with mountain bikes. A more appropriate comparison is guns with cigarettes. Both have their enthusiasts who refuse to admit that any harm is done by the objects of their enthusiasm; both have powerful lobbies in Washington (the Tobacco Institute, the NRA) funded in part by the manufacturers, lobbies that thwart stronger laws supported by the vast majority of Americans; and proponents of both claim research supports their position despite much evidence to the contrary.

Gun control is a controversial issue, and people deserve to hear both sides. Contributions such as Mr. McConnell's add nothing to the debate.

Jeffrey Shallit
Kitchener, Ontario

1. Laurence H. Tribe and Michael C. Dorf, "On Reading the Constitution," Harvard University Press, 1991, p. 11.
2. Stuart Jay Deutsch and Francis B. Alt, The effect of Massachusetts' gun control law on gun-related crimes in the city of Boston, *Evaluation Quarterly* 1 (1977), 543-568.
3. Colin Loftin, David McDowall, Brian Wiersema, and Talbert J. Cottley, Effects of restrictive licensing of handguns on

homicide and suicide in the District of Columbia, *New England Journal of Medicine* 325 (Dec 5 1991), 1615-1620.

P.S. The following books address the gun control issue in a much more intelligent way than Mr. McConnell's article. Why not describe THEM in one of your sidebars?

Lee Nisbet, ed., *The Gun Control Debate: You Decide*, Prometheus Books, Buffalo, NY, 1990.

Franklin E. Zimring and Gordon Hawkins, *The Citizen's Guide to Gun Control*, Macmillan, NY, 1987.

Hope you never test this theory

This letter is in response to the "Thinking of buying a gun?" box in the "Firearms: No Right is an Island" article [#77:44]. The author makes many good points about weapon ownership, however, the author overlooked shotguns for self-defense in the explanation of which pistol is most effective. Shotguns are easier to aim (you use both hands), easier to hit things with if one is shooting anything but a rifled slug (the lead shot spreads out when it leaves the barrel) and MOST IMPORTANTLY it is only a close range weapon. It is an extremely lethal weapon at close range, but *does not* carry the energy to kill someone in the house next door if the intended target is missed. There are many documented cases of an innocent person being killed by a stray bullet from a pistol. If a bullet from a .22 can carry over a mile and a half and still kill someone, just think what a .38 special is capable of.

If the gun is intended for self-defense away from the home, where a shotgun would be too large, one should consider the concentrated pepper sprays with a range of 10 feet or more. The trajectory of the pepper spray can be actively corrected if initially it is off target. Nearly all handgun use between humans takes place at close range, fitting neatly into the range of the pepper spray and not threatening innocent people miles away.

In addition, if one has never shot a weapon before, one should start with a .22 rifle. Ammunition is inexpensive and the reduced recoil allows for easier development of good shooting form.

Please, if anyone considers buying a weapon for self-defense get a shotgun. Pistols are too lethal to innocent people.

Andy Ross
Bellingham, Washington

By next year, everything'll be great

I received a request to renew my subscription with the promise that if I do it now (I would have to only Spring next year) I shall get a free index for the last 5 years. This is fine with me, but I am having some thoughts that I would like to relate to you.

As I understand it, WER is produced on a shoestring budget. I like my subscription very much, sometimes the ideas are a little cranky, but the magazine is never boring; I read my copies from cover to cover (with the exception of those articles where you become mythical). The point is, in earlier times you published a financial statement from which it could be seen how well you do. You have a tendency to borrow money from your customers which you really should get only by the time it is really due. I am having the impression that you are constantly out of money, and this offer now to renew early and get more — hey guys, does this really pay for you? Or isn't this creating revenues that are welcome now, but will be sorely missed next time around, i.e. next year when you are really entitled to it?

I don't mind to renew early, but I am out of a job myself. Otherwise I might even give a free contribution, but now I simply cannot afford it. I am sending this to you because I would hate to see you get out of business. I would love to hear, and see firm evidence, that you are doing well. Please get your financial act together.

Falk Koenemann
Aachen, Germany

Gossip

The big news is the gestating *Millennium Whole Earth Catalog*, and it's about time, too. It'll replace our untraditionally short & fat, now obsolete (though ever-useful) *Essential Whole Earth Catalog*, which appeared way back in 1986 when things were different. The new one will be more globally relevant and future-oriented than its predecessors. That means much hunting, gathering and research in addition to the usual editing and production. It has to be in the box in July '94, which seems like next week. How you can join the fray is elucidated on the insert elsewhere in this issue, and we hope you do. It's a big opportunity for all of us.

The complex catalog construction will take place alongside the usual magazine production. To make this possible without self-immolation, we are in the proc-

Ubdades ad Corregtions

From WER #78 (Spring '93):

Menstat (p. 34) product support is available from 512/477-1366; FringeWare, Inc.'s address is P. O. Box 49921, Austin TX 78765-9921. Email: fringeware@wixer.bga.com

The new phone number for ordering Devil Sticks and *The Devil Stick Book* (p. 90) is 212/941-0060.

The correct number from which to order *Cheap Tricks* (p. 122) is 800/742-4847.

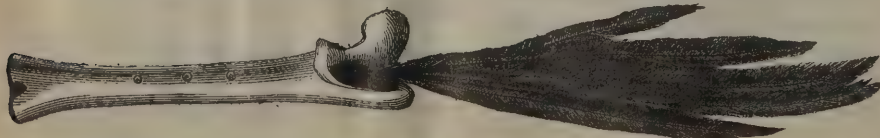
From WER #77 (Winter '92):

SPERDVAC (p. 56) — the Society to Preserve & Encourage Radio Drama, Variety & Comedy — has a new address: P. O. Box 7177, Van Nuys, CA 91409.

From WER #68 (Fall '90):

Factsheet Five (p. 64) is now published in hard copy by Seth Friedman (P. O. Box 170099, San Francisco, CA 94117); sample issue (#46 — now glossy) \$6 postpaid. One-year, six-issue subscriptions are \$20 - \$40 depending on desired postal rate.

Factsheet Five is also available online (as *Factsheet Five — Electric*) via subscription (jerod23@well.sf.ca.us for information), via anonymous ftp (red.css.itd.umich.edu), and as part of The WELL's gopher service. ☺



ess of, um, *adjusting* the space, hardware (it'll be all electronic this time), tasks, job labels and personnel to make this possible. Some of the changes

He further implied and that she

But Board members responded by

scalding!" They

pygmies,

but

replied in kind.

We still haven't heard the splash.

Nonetheless, James says he won't believe any of it until he sees whitened skulls on the beach.

On other fronts, we Thought Globally and Danced Locally again on Feb 27 at Opts Art gallery in San Francisco. The Thinking centered around a discussion of Biosphere 2 with our former editor Kevin Kelly and Evelyn Pine from Computer Professionals for Social Responsibility. A live, two-way video/phone hookup with the Biospherians (organized, assembled and operated by those in the thanksbox below) added a convincing but

rather ethereal realism to the proceedings — the sequestered scientists seemed to be speaking from another planet, which they sort of were. There's a small electronic delay in the arrangement, similar to the one you work around when phonetalking to someone in another country. Mutually coordinated timing of sound and picture with live action proved to be elusive, especially when the Biospherians attempted to Dance in their Locally to the tumultuous music of the Cafe Babar Jug Band present at our Locally. Will there be more of these parties, you ask? Dunno. Probably not for a while; the alligators are sphincter-high already and we haven't really started the new *Catalog* yet. —J. Baldwin

Flash! As we go to press,

Here is our full-year report for 1992. We lost \$32,270 over the year, due to spending approximately \$40,000 on developing new projects for Point Foundation. That investment has paid off in the form of an offer of a substantial advance to produce a new *Whole Earth Catalog* (see the insert in this issue for more information).

Between the *Catalog* and other new efforts (including other books, electronic publishing, grant seeking and other fundraising), we anticipate a better bottom line for 1993 and 1994.

The disclaimer: This report is for informative purposes only, and should not be seen as an Official Financial Statement.

—Keith Jordan

1992 Income & Expenses

Income	
Subscription Income	475,379.17
Back-Issue & Single-Copy Sales	14,588.05
Newsstand Sales (after Returns)	195,917.49
Book & Product Sales	33,144.79
Royalties	3,447.64
List Rental	15,546.55
Unclassifieds	10,528.27
Contributions	24,854.00
Other Income	12,164.76

Total Income 785,570.72

Expenses	
Payroll & Related Expenses	417,373.79
Printing WER	105,144.29
Writers & Illustrators	26,795.70
Editorial/Production Expenses	7,755.38
Fulfillment/Promotion Expenses	115,816.93
Newsstand Expenses	22,880.25
Book & Product Sales Expenses	22,530.98
Rent, Maintenance & Utilities	56,324.35
Insurance & Taxes	5,581.04
Office & Computer Supplies	15,047.99
Depreciation	8,146.00
Postage & Phone	14,775.52
Other Expenses	(331.30)

Total Expenses 817,840.92

Net Change in Fund Balance (32,270.20)

Balance Sheet: December 31, 1992

Assets	
Cash	20,128.12
Accounts Receivable	80,909.62
Inventory	6,582.00
Fixed Assets Less Depreciation	16,571.25
Other Assets	41,803.70

Total Assets 165,994.69

Liabilities	
Accounts and Contracts Payable	77,650.23
Subscription Liability	501,077.90

Total Liabilities 578,728.13

Fund Balance (412,733.44)

TG/DL THANKS TO:

Biosphere 2 Folks inside and out: all the Biospherians, especially Linda Leigh and Taber MacCullum, and Scott McMullin in Public Affairs

Picture Tel Eric Murphy, Bill Murray & co for the generous donation of time and videophone equipment

Biocom, Inc. Joel Goldblatt, for helping put the pieces together

Ultrasound Sound equipment, and the calming presence of Howard Danchik and Derek Featherstone.

Illuminated Media Marc Herring and Padraic MacLaughlin for the lights and cool ambient projections

Digital Media Dan Mapes and crew for the computer equipment and the big art

Opts Art Caroline Cho and Coy Dugger, two of the most tolerant people on Earth.

Warren's Waller Press

AND NUMEROUS INDIVIDUALS:

Kevin Kelly, Evelyn Pine and Phil Catalfo (MC extraordinaire); Paul Hoffman and Philip Habib for muscle; Bob & Greta Bickford and Erica for making us feel secure; John (nepotism is a wonderful thing) Norris for door duty; Freddy Hahne — "How do we love you? Let us count the ways"; Lynn Carruthers (she came, she saw, she organized).

—Marly Norris



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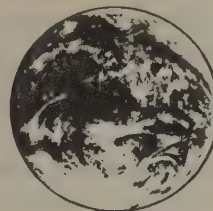
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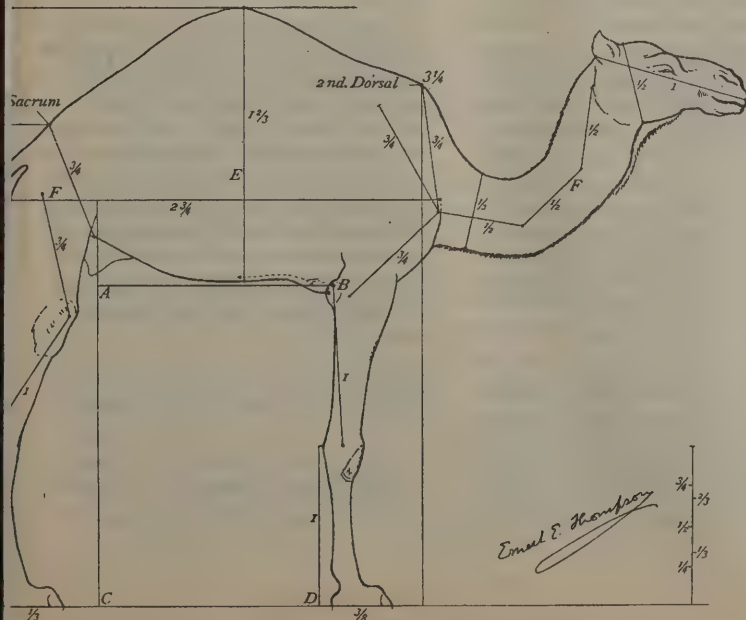
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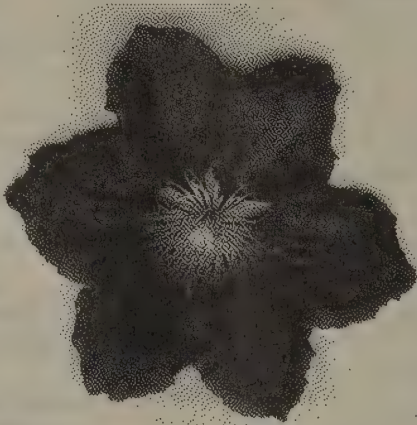
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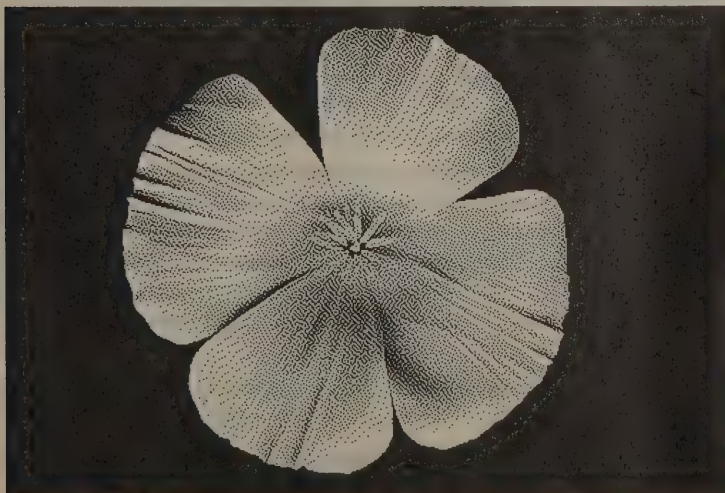
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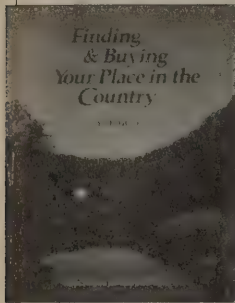
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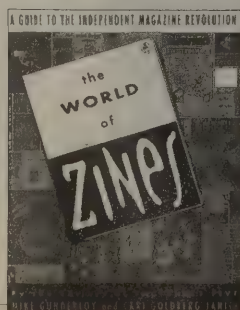
Mike Gunderloy and Cari Goldberg Janice, editors of Factsheet Five

Whole Earth Review has regularly featured Mike and Cari's gleanings from the more than 10,000 small magazines — "zines" — being published today in the US. They have chronicled these publications in the pages of *Factsheet Five*.

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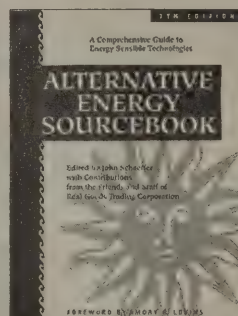
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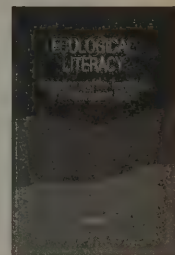
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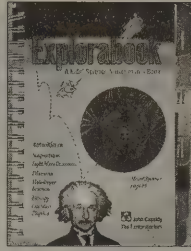
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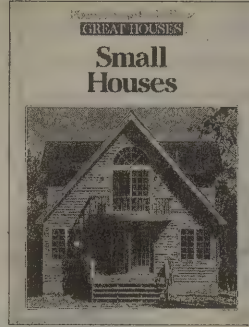
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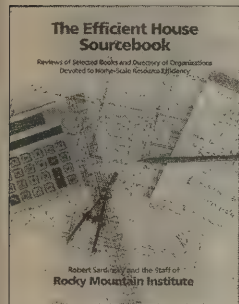
small, take less time and money to build, and use less energy. And they share here all the lessons they learned in the process.

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Robert Sardinsky and the Rocky Mountain Institute



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Shelter

Edited by Lloyd Kahn

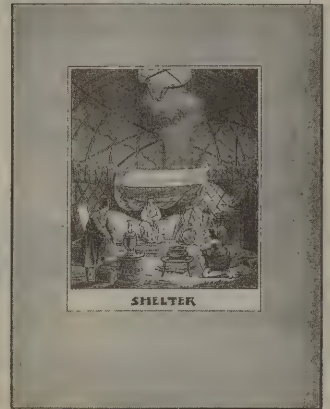
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A Pattern Language (Towns, Buildings, Construction)

Christopher Alexander, et al.

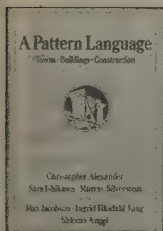
This book provides a language for talking about what people really need from buildings and communities.

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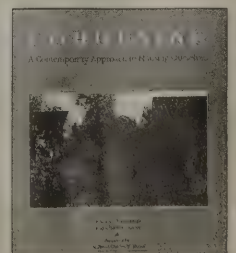
Kathryn McCamant and Charles Durrett

A beautiful book that has inspired many of the cohousing projects built or planned in the US.

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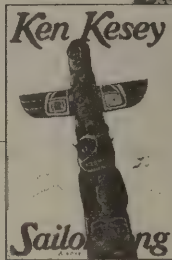
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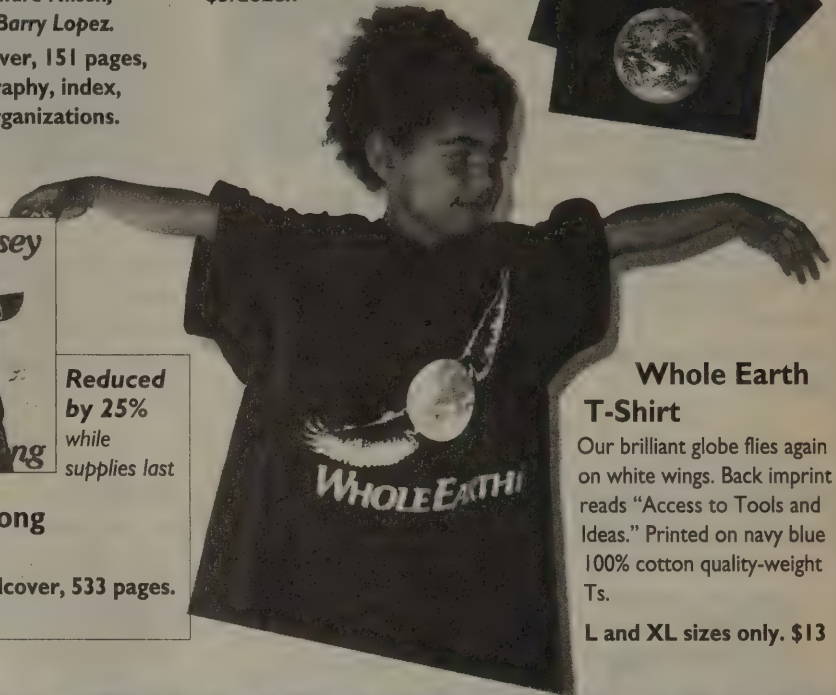
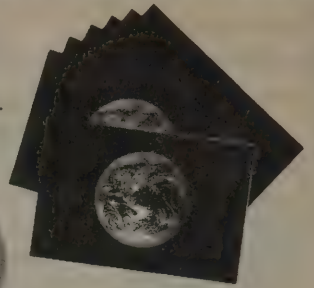
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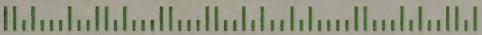
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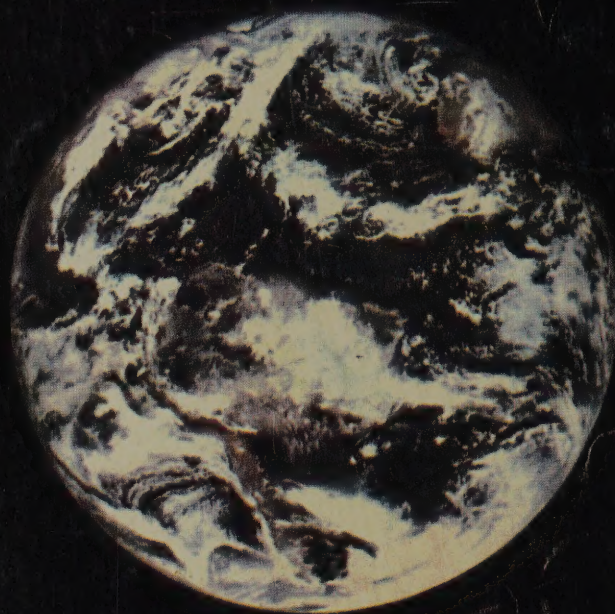
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